



## 2010 Louise Brearley Messer ANZSPD Post-graduate Essay Competition

### Miniscrew implants in Orthodontics and Paediatric Dentistry

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#### Introduction: New Uses for Dental Implants

Conventionally, dental implants are used to replace missing teeth or support removable dentures. In the past decade, case reports and small studies demonstrated yet two more uses: their use in orthodontic anchorage, and their use in paediatric dentistry to replace missing teeth. In fact, their use in orthodontics has already become so popular that a recent study indicated that 92% of postgraduate orthodontic students in the USA plan to use them in their practices<sup>1</sup>.

The tissue regeneration research may well mean that, in the future, missing teeth will be replaced by tissue-engineered teeth. Unlike dental implants that behave like ankylosed teeth, engineered teeth will have the advantage of having a periodontal support. It is ironic that this 'ankylosis' disadvantage of dental implants is the very same reason why they are used in orthodontics for orthodontic anchorage.

#### Anchorage

Newton's third law of motion, 'for every action, there is an equal and opposite reaction' explains that not only the teeth intended for orthodontic movement will be moved, but some movement will inevitably happen to the anchor teeth. Anchorage is defined as 'resistance to unwanted tooth movement'<sup>2</sup>. It can be intraoral or extraoral. Intraoral anchorage is usually obtained from teeth or the palate. Extraoral anchorage is usually obtained through the use of headgears. However, headgears are generally uncomfortable for patients and depend on their compliance<sup>3</sup>, and may result in soft tissue injuries<sup>4</sup>.

Absolute anchorage is defined as "no movement of the anchorage unit"<sup>2</sup>. Such anchorage can not be obtained from conventional intraoral methods<sup>5</sup> and can only be obtained by using ankylosed teeth. This is because in ankylosed teeth, the anchorage forces are transmitted to the bone. Another similar method that depends on the bone for obtaining absolute anchorage is the use of implants as anchor units.

Three different implantable devices can be used for enhancing orthodontic anchorage: implants, screws and plates. Since they are generally smaller than conventional implants, they are preceded usually by the prefix mini. These 'devices' help with orthodontic anchorage by supporting the teeth of the anchorage segment (indirect anchorage), or by acting directly as the anchor units<sup>6,7</sup>.

#### Terminology and Classification

Cope<sup>8</sup> used the generic term Temporary Anchorage Device (TAD) to refer to all types of implants, plates and screws that are used for temporary orthodontic anchorage. However, TAD is too generic a term since headgears, Nance appliance, etc are temporarily used for anchorage as well<sup>9</sup>. Cope<sup>8</sup> also proposed the term miniscrew implants to cover both implants and screws. The term was later adopted by other researchers<sup>7</sup>, and is used in this paper to describe mini-implants and miniscrews.

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Cope<sup>8</sup> also suggested a classification for TADs based on the means by which they attach to bone: either biochemically (osseointegration) or mechanically. Implants and mini-implants by definition imply that they osseointegrate, whereas screws are mechanically retained in bone. This classification essentially divides TADs into implants (e.g. palatal and retromolar implants, onplants), and screws (e.g. miniscrews, miniplates). In general, screws are smaller in diameter than implants, do not fully osseointegrate and are designed for immediate loading<sup>7</sup>.

## Description

Most of the screws and implants currently used for anchorage are less than 2.5mm in diameter<sup>8</sup>, hence the term miniscrew implants. The decreased diameter allows for insertion into critically tight areas (e.g. proximal to roots). However, with a diameter less than 1.2mm there is an increased risk of fracture<sup>10</sup>, and therefore most miniscrew implants currently have a diameter ranging between 1.2 and 2.5mm, although larger implants are still being used. The most commonly used lengths are 4-12mm<sup>11</sup>.

A limitation to the use of conventional 'root form' implants for orthodontic anchorage is having adequate bone and adequate site, thus limiting their use to edentulous areas. Moreover, placing an implant for orthodontic anchorage/prosthetic use is not recommended in growing patients since the implant will behave like an ankylosed tooth and will become submerged.

Palatal bone may provide enough thickness to support smaller implants and overcomes the problem of finding an edentulous area for implant placement. Block and Hoffman<sup>12</sup> described a disk-shaped implant to be placed subperiosteally on the palatal bone; they named it the 'onplant'. It is a 2mm thick titanium alloy disk that is 10mm in diameter. The authors conducted two animal studies and concluded that the onplant system was successful in delivering absolute direct anchorage. Celenza and Hochman<sup>13</sup> reported three failures with the onplant system, which resulted in this approach being rarely used now<sup>5</sup>. The onplant has now been superseded by another system that depends on a self-tapping implant, osseointegrating into the palatal bone before loading; the Orthosystem (diameter 3.3mm, length 4-6mm)<sup>14</sup>. A trephine cut

is needed to remove the implant after treatment completion.

Concerns have been raised about the use of osseointegrated implants because of the need to use a trephine to retrieve the implants, the limited use in the dental arch, and the compromised alternative sites like the retromolar area and the palatal area. The retromolar area is complicated by limited access and possible damage to the neighboring nerves. The palatal area is complicated by the reduced height of bone available, the slow bone turnover resulting in prolonged healing time, and being not recommended in pre-adolescent patients due to the possibility of damage to the midline suture<sup>5</sup>.

Further trials led to the introduction of miniscrews, based on their original use to splint fractured bones. Miniscrews offer several advantages: being small allows their placement closer to roots and in smaller areas like the anterior nasal spine, they do not require a mucoperiosteal flap and they rely on mechanical attachment to the cortical bone allowing immediate loading and easier retrieval.

Most of the miniscrew implants are made of titanium alloy. There are also different designs for the head, with a button-like design being the most popular. Miniscrew implants are either conical in shape, or have a parallel shape tapering at the end<sup>7</sup>. A recent study<sup>15</sup> used finite element analysis (FEA) to assess the effect of different design parameters on the stability of the miniscrew implants. They found that the mini-screw material, screw exposure length and screw diameter were the major factors affecting bone strain and implant stability.

Another type of TADs is the miniplate. Miniplates are made of titanium and were originally used to fix fractured bones. For orthodontic anchorage, the plates are modified in a way that an extension projects through the incision made during their placement. This extension is then used to allow forces to be exerted by attaching teeth to the extension via elastic chains. They can be placed in the maxillary buccal sulcus, the mandibular buccal sulcus, or the inferior surface of the zygomaticomaxillary buttress<sup>16</sup>.

## Loading Protocols

The waiting time before loading depends

on many factors. Implants' anchorage are different from those used for prosthetic replacement, since those used in prosthetics are generally subjected to axial, heavy intermittent loading, while those used for anchorage are subjected to non-axial, light and continuous forces. The use of the implant, its location, type and design will dictate the waiting time. For example, if the anchor implant is intended for later prosthetic use, loading should be delayed until osseointegration occurs. If an implant is placed in dense bone, immediate loading is possible. In addition, a threaded implant will achieve mechanical retention and can be loaded immediately but this is not the same for those with smooth design<sup>17</sup>.

In a histological study in dogs, Freire et al<sup>18</sup> found that immediate or early loading did not affect miniscrew implant survival and results indicated that the application of an orthodontic load immediately after placement is possible. In a clinical study in which 134 miniscrew implants were placed, no significant association was found between the success rate and immediate loading<sup>19</sup>.

## Indications and Uses

Since miniscrew implants and miniplates have started to gain popularity in orthodontics, several recent papers have described their possible uses<sup>7,16,20</sup>:

- A) In the sagittal plane:
  - a. Retracting upper anteriors in full unit Class II molar relation
  - b. Retracting and realigning anterior teeth or correcting the midline when no posterior teeth are present
  - c. Correcting severe bimaxillary protrusion
  - d. Molar uprighting, distalisation or protraction
  - e. Closing edentulous spaces in first molar extraction sites
- B) In the vertical plane:
  - a. In anterior open bites requiring intrusion of the maxillary segment
  - b. In deep bite and 'gummy smile' requiring upper anterior teeth intrusion
  - c. Intrusion of a single tooth or a group of teeth in cases of overeruption
  - d. Extrusion of impacted canines and impacted molars

- C) In the transverse plane:
  - a. Skeletal anchorage for rapid maxillary expansion
- D) Other uses:
  - a. Stabilization of teeth with reduced periodontal support
  - b. Hypodontia where the teeth present cannot provide enough anchorage
  - c. Orthodontic/prosthetic use
  - d. Orthopaedic uses such as in anterior and inferior movement of the maxilla in cleft palate patients and patients with maxillary hypoplasia

### Comparison Between Different Types of Anchorage Systems

Several studies have compared anchorage produced by extraoral or intraoral methods and by TADs. All the studies found better anchorage was achieved with TADs. Benson et al reported a 1.5mm loss of anchorage with palatal implants compared with 3mm with headgears. Similar results have been reported by other studies<sup>21,22</sup>. Kim et al<sup>23</sup> reported no loss of anchorage using miniplates for premolar retraction.

### Possible Placement Sites

Possible sites for miniscrew implant placement in the maxilla include the inferior surface of the anterior nasal spine, the median and paramedian areas of the palate, the inferior side of the zygomaticomaxillary buttress, alveolar bone, and the maxillary tuberosity. The tuberosity may, however, be too thin and is not recommended for miniscrew placement<sup>7</sup>. A miniscrew implant with a length of 4-6mm may be placed in the median area of the palate<sup>24</sup>. However, complete ossification of the midpalatal suture is rare before the age of 23<sup>25</sup>, and Huang et al<sup>17</sup> recommended the placement of palatal implants in the parasutural areas in adolescents for this reason.

Possible sites in the mandible include alveolar bone between the roots, the symphysis or parasymphysis, and the retromolar area<sup>7</sup>.

Fayed et al<sup>26</sup> used cone beam tomography to locate the best sites for miniscrew implant placement in alveolar bone. They recommended that the optimal site in the anterior maxilla is between the central and lateral incisors and

between the lateral incisor and canine in the anterior mandible. In the posterior maxilla and mandible the recommended sites were between the second premolar and the first molar and between the first and second molars.

### Placement Procedure

Kim et al<sup>27</sup> demonstrated similar histological outcomes in animal studies using drill-free miniscrew implants or miniscrew implants requiring predrilling, with both groups demonstrating similar degrees of osseointegration. A recent paper<sup>28</sup> argues that the insertion torque has the strongest effect on the success of the implants, and that other factors such as predrilling may indirectly affect the success rate by affecting the insertion torque of the implant. Since the self-drilling miniscrew implants depend on mechanical retention, they usually benefit from high insertion torque. But this will also compromise the long term stability of the implant by compressing the surrounding bone resulting in bone necrosis. Therefore, unless a torque-controlling ratchet is used, predrilling should be performed to minimise the torque. However, in areas with thin cortical bone, predrilling may not be necessary and self-drilling implants may be used.

### Removal Procedure

Miniscrew implant removal is usually simply done by using the same screwdriver used for their placement<sup>7,23</sup>. This is because they are minimally osseointegrated. Those implants that are osseointegrated can either be buried or surgically removed using a trephine cut.

### Complications and Failures

Miniscrew implants show higher failure rates than conventional dental implants, with approximately a 10-17% failure rate<sup>20,29</sup>. This is because they are not designed to osseointegrate, as osseointegration would make their removal complicated and traumatic. In fact, most miniscrew implants are manufactured with a smooth surface, reducing the amount of bone ingrowth around them<sup>7</sup>. This characteristic combined with early loading commonly results in a layer of fibrous tissue between the implant and the bone which may explain some of the loss of anchorage that occurs.

### Loss of anchorage:

Liou<sup>30</sup> recommended that a 2mm safety clearance should be kept between the miniscrew implant and the roots of the neighbouring teeth. This is because if loss of anchorage occurs the implant may move slightly. Minimal loss of anchorage of miniscrew implants has also been reported by other studies<sup>31,32</sup>.

### Loosening of the miniscrew implants:

Lin et al<sup>15</sup> in their FEA study demonstrated that the larger the screw the less the strain on the bone and the less the chances of loosening. Older studies recommended not loading the implant until osseointegration has occurred. This is because early loading may be detrimental to the osseointegration. However, miniscrew implants depend to a large extent on mechanical retention, and Lin et al<sup>15</sup> demonstrated that the bone strain was not significantly different between an osseointegrated group and a non-osseointegrated group. It is therefore generally agreed now that immediate loading is acceptable. Primary stability at the time of insertion, representing mechanical retention, is important and failure of the miniscrew implant might occur if there is lack of primary stability. This is usually due to lack of adequate thickness of the cortical bone<sup>33</sup>.

The miniscrew implant may also become loose as a result of inflammation of the peri-implant tissues. Baumgaertel et al<sup>20</sup> recommended placing the implants in attached gingiva clear of the frenal tissue to minimize tissue irritation and inflammation. Infection of the tissues around the implant may happen, although its occurrence does not pose problems<sup>33,34</sup> and chlorhexidine can be used to prevent or control infection.

Chen et al<sup>35</sup> reported more failures of miniscrews in the mandible than in the maxilla. Crismani et al<sup>29</sup> attributed this to overheating of the denser bone of the mandible during placement.

### Injury to adjacent structures:

Another complication is injuring adjacent roots, periodontal ligaments, nerves, and blood vessels during implant insertion. It rarely happens that an injury occurs to the roots as the miniscrew implants are specifically designed not to cut into roots<sup>20</sup>. It is possible, however, to injure the periodontal tissue, which may fully heal, or result in point ankylosis. In such instances, the implant should be

removed. Kadioglu et al<sup>36</sup> conducted a clinical study to examine later extracted premolar root surfaces after intentional contact with miniscrews. They found that root surfaces that touch miniscrews undergo rapid repair and almost complete healing within a few weeks after removal of the implant.

## The Future

The lack of enough prospective studies to show the effectiveness of TADs was stated in a Cochrane review on their use<sup>5</sup>. In addition, more prospective long term studies are needed to demonstrate the outcomes of miniscrew implants in managing tooth loss following avulsion and hypodontia in children.

Since by definition, TADs are only used temporarily, an implantable device that is resorbable and does not require retrieval may be even superior to titanium TADs. An animal study<sup>37</sup> has described the successful use of resorbable polylactic acid screws for orthodontic anchorage, therefore avoiding the need to remove the implants surgically. However, a recent FEA study<sup>15</sup> demonstrated that materials other than titanium alloys transmit unfavourable strain to the surrounding bone, which may result in bone remodelling and loosening of the screws. More research is still needed in this area.

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## Seal Cambodia Project NEEDS YOU!

*Seal Cambodia* is an exciting **3 year project** to save children's teeth in Cambodia, where the levels of dental decay are among the **highest in the world** (dmft of 8-10 at age 5).

The project is supported by the Global Child Dental Fund (GCDF), the Cambodian Children's Charity (Camkids), and GC (Asia) Company. ANZSPD has also made a generous donation. It has the approval of the Ministry of Education and Ministry of Health. It aims to seal the first permanent molars of 60,000 Grade 2 children over the next three years. To do this, we need your help!

Local partners for the project in Cambodia are One-2-One, International University, the Oral Health Office of the Ministry of Health, the Pediatric Clinic of the University of Health Sciences, Cambodia World Family, the Cambodian Dental Association and the Regional Nurses Training Centre in Kampong Cham. They are providing some of their own members and personnel – but we also need your help!

We are seeking self-funded overseas volunteer dentists, hygienists, therapists and senior dental students to come to Cambodia for one to two weeks, to work in primary schools to achieve our goal of sealing 20,000 children per year. We can arrange pick up from the airport, accommodation, local sightseeing, transport to and from the schools, and assistants to work with you. Training on how the program works and the protocols for GIC sealant placement will be given. Instruments and materials needed will be provided.

We know this project will make a huge difference to the dental health of these children – most of whom presently face extraction of their 6s by the time they reach high school. For more information please contact the SEAL CAMBODIA team at: [sealcambodia@hotmail.com](mailto:sealcambodia@hotmail.com)

In addition, there are many other exciting dental opportunities for volunteers in Cambodia. And donations of used burs (and other items) are always very welcome. Please join us to make a difference in this part of the world. Please contact: [gcdfundcambodia@hotmail.com](mailto:gcdfundcambodia@hotmail.com)

We look forward to seeing you in Cambodia soon!



## Federal President's Report

by John M Sheahan

Welcome to 2013! I trust that every one of you enjoyed a break from your dental practice over the last few weeks and that you have had an opportunity to catch up with your friends and family during that time. I hope that you will all enjoy a safe and prosperous year ahead.

As I sit here on Australia Day, 2013, I am reminded that on this day in 2012, it was announced that our esteemed member, Emeritus Professor Louise Brearley Messer AM, had been made a Member of the Order of Australia for "service to the dental profession, particularly in the field of paediatric dentistry, as a clinician, academic and researcher". I am pleased to say that ANZSPD initiated her nomination for this award. Those present at ANZSPD's Biennial Conference in Canberra in July, had an opportunity to congratulate Louise personally. Many members of the Victorian Branch and several of her past post-graduate students now living interstate also took an opportunity to celebrate her achievement at an afternoon tea organized in her honour at the Melbourne Club in November. Since then, Louise has accepted Honorary Membership of ANZSPD Inc. Although Louise has been an Honorary Member of the Victorian Branch for some time, Louise is the first Honorary Member that ANZSPD's Federal Council has elected.

The next International Association of Paediatric Dentistry (IAPD) Congress will soon be upon us. This meeting will be held in Seoul, South Korea with pre-congress courses, the Opening Ceremony and the Welcome Reception all scheduled on 12th June, 2013, and with the final day of the Scientific Program and Farewell Dinner scheduled on 15th June, 2013. To be convened in the state-of-the-art Coex Convention and Exhibition Centre, the 24th IAPD Congress promises to be an exciting and memorable experience. I encourage you consider joining the many Australian and New Zealand colleagues who will be in attendance, especially as direct non-stop flights to Seoul are available from Auckland, Brisbane, and Sydney. More details of the Congress are available on the website: [www.iapd2013.org](http://www.iapd2013.org). Please note that early registration for the Congress closes on 31st March, 2013.

As many of you would know, the IAPD has an ANZSPD member, Dr Eduardo Alcaino, as its President. Ed's term in

office will come to an end during the IAPD Congress in Seoul. I expect he will continue on the IAPD's Board of Directors as Immediate Past President until the end of the 25th IAPD Congress, which is to be held in Glasgow, UK in July, 2015. Over the years, we in Australia and New Zealand have been well represented by having one of our own members on the IAPD Board of Directors. In July, 2015, we may be left without a representative on the eight member Board of Directors. If any ANZSPD member has an interest in becoming more involved in IAPD affairs, I encourage him/her to advise Dr Alistair Devlin, the Secretary/Manager.

The RK Hall Travelling Lecture Series, which is proudly sponsored by Colgate, is the next major event on ANZSPD Inc's calendar. It will be held in February/March, 2014 and be organized by the Victorian and New Zealand Branches, which will each host a leg of the tour. Planning for this event is well underway. In the interim, Branches will be holding periodic continuing education meetings which will showcase the best of paediatric dentistry to the local membership. I trust I will have an opportunity to meet many of you at one of these Branch meetings during my term in office.

In my last Federal Report, I promised I would expand on how ANZSPD has been representing the membership and the dental health interests of the children of Australia and New Zealand during the last few years. There are three major issues that have demanded the attention of the Federal Council and have been worthy of submissions on behalf of the membership: the increasing difficulty dentists in Australia are having accessing hospital operating theatres in which to perform dental treatment for patients under general anaesthesia; the increase in regulation of the use of anxiolysis (minimal conscious sedation) which the Dental Board of Australia (DBA) mooted in its discussion paper; and the Dental Benefits Amendment Bill 2012.

ANZSPD has made formal submissions to the Australian Dental Association

(ADA) and to the Victorian Branch of the ADA (ADAVB) regarding the difficulty dentists are having obtaining and continuing to maintain access to operating theatres for dental treatment under general anaesthesia. Virtually every paediatric dentist in Victoria has been affected by this issue. The number of hospitals offering operating rights to dentists wanting to provide restorative treatment under general anaesthesia is in decline. General dental practitioners are having the greatest difficulty accessing theatres. Moreover, the majority of paediatric dentists in Victoria has lost operating rights at one or more hospitals and has had difficulty finding alternative hospitals willing to replace those lost lists. When alternative hospitals are found, they are often at an inconvenient distance from the paediatric dentist's practice. Newly graduated paediatric dentists are also having difficulty getting operating rights at hospitals. Private hospitals in Victoria have asked many general dentists and paediatric dentists to pay a booking fee on behalf of their patients to subsidize the costs of the hospital admission because the hospital is unable to negotiate a sufficiently large refund from the major private health insurance companies to make the dental list sufficiently profitable. In order for the dentist not to be financially disadvantaged, this fee then needs to be passed onto the patient by the dentist without the patient being made aware that it is an indirect fee for the hospital admission. The problem of accessing operating theatres for restorative dental treatment under general anaesthesia is not limited to Victoria but the problem is most acute there. Members in Queensland also report having lost operating lists at private hospitals as their lists were not sufficiently profitable for the hospital. In New South Wales, some hospitals have fined members on a per minute basis when the operating time ran over the hospital's maximum allowable duration for a case. In South Australia, a member has reported that a hospital preferred to keep its operating theatre empty than fill it with a paediatric dentist's restorative dental list. Although

the sample size was small, a survey of delegates, conducted at Uluru during the RK Hall Lecture Series in 2011, confirmed that the problem of accessing operating theatres for restorative dental treatment was widespread in Australia.

Why do the members of one Australian ANZSPD Branch experience more problems than those in another? Despite what one might intuitively think, the way the private health insurance industry interacts with hospitals in Australia is not homogeneous. For example, the monthly premium paid by members of Medibank Private in New South Wales is different from that paid by members of the same fund in Victoria. The amount paid by the health insurance companies to the private hospitals on behalf of their patient members for the same procedure of the same duration also varies from company to company, from hospital to hospital and from state to state. Evidence suggests that the health funds are less generous for dental admissions to Victorian hospitals than they are in other Australian jurisdictions. Accessing operating theatre time is not generally as difficult for members of the New Zealand Branch as the patient (or their parent / guardian) is totally responsible for the hospital fee as hospital admissions for dental treatment under general anaesthesia are not covered by private health insurance companies there. This in itself is a problem.

ANZSPD's submissions on this matter have been very useful in creating awareness in the broader profession about the on-going and worsening problems facing dentists in Australia whose patients need to access general anaesthesia for dental treatment. In response, the ADAVB has been more active in coordinating action on the profession's behalf. Nevertheless, the profession needs to work together to turn the current situation around. I would be most interested to hear your experiences if you too have had problems accessing operating theatres for your patients.

On the second issue, ANZSPD made a submission to the DBA in response to the "DISCUSSION PAPER – ANXIOLYSIS", which was released by the DBA on 5th June, 2012 and upon which the DBA invited comment from the profession. I believe that ANZSPD was the only organization which specifically represents the dental interests of infants, children and adolescents which took the time to respond, or indeed, felt the need to respond to the DBA discussion paper. The DBA's discussion paper and ANZSPD's response are published in full elsewhere in this edition of Synopses. The DBA's

discussion paper can also be viewed on the DBA website at the following address: <http://www.dentalboard.gov.au/News/Past-Consultations.aspx>.

The author of the DBA's discussion paper proposed, in effect, that dentists offering anxiolysis (minimal conscious sedation) must ensure that they and their staff are trained in advanced life support on a simulator, that is, are trained to use manual defibrillators, place endotracheal tubes, insert IV cannulae, administer a range of drugs, including amiodarone if required, and have on hand and use a range of sophisticated medical equipment if required. If left unchallenged by ANZSPD, it is quite likely that the discussion paper, as published, would have formed the basis for the DBA's regulations. No doubt as a result of feedback from members of ANZSPD, the author of the DBA's discussion paper was more recently heard to concede that it is unnecessary for dentists offering anxiolysis to ensure that they and their staff are trained in advanced life support. The view that training in advanced life support is unnecessary for dentists offering anxiolysis was also endorsed at the "Sedation in Dentistry" continuing education course which was held in Sydney in November, 2012. The keynote speaker at this event was Dr Alan Milnes DDS, PhD, FRCD(C). Dr. Milnes is a founding and current faculty member of the American Academy of Pediatric Dentistry continuing education program, "Contemporary Sedation of Children for the Dental Practice - Enteral and Parenteral Techniques". It was his view and that of one of the conveners of the program, Dr Eduardo Alcaino, that dentists only need to be prepared to rescue the patient from a level of sedation one level higher than the intended level of sedation. In other words, if the intention is to produce anxiolysis (minimal conscious sedation) then the dentist needs to be prepared to rescue the patient if the patient should unintentionally slip into a moderate level of conscious sedation.

When approached by me late last year, Ms Tanya Vogt, the Executive Officer at the DBA responded that, "The Dental Board's Expert Reference Group – Therapeutics will meet late in November", 2012 "to discuss and consider the feedback the Dental Board has received with respect to the discussion paper and if necessary make recommendations to the Dental Board." From this comment, it is clear that the DBA is likely to publish regulations in 2013 for the administration of relative analgesia using nitrous oxide/oxygen on its own and relative analgesia using

nitrous oxide/oxygen in combination with local anaesthetic. Similarly, the DBA is also likely to publish regulations in 2013 for the administration of a single low dose oral sedative drug on its own for anxiolysis, or when used for anxiolysis in combination with local anaesthetic.

Any regulations published by the DBA are likely to be examined carefully by the Dental Council of New Zealand and may have ramifications for members of our New Zealand Branch. Therefore, members on both sides of the Tasman Sea should be eager to read any documents about anxiolysis published in future editions of the DBA's newsletter or on its website.

The third issue on which ANZSPD has made a submission was Dental Benefits Amendment Bill 2012. This Bill relates to the Child Dental Benefits Schedule (CDBS) which was announced by the Australian government to commence on 1 January 2014 as an expanded replacement scheme for the Medicare Teen Dental Program. Once again, I thank Dr John Winters for advising ANZSPD's Executive that the New South Wales Branch of the ADA (ADA (NSW)) was seeking input from interested parties before preparing a written submission to the Senate Committee which was inquiring into and reporting on this Bill. John also supplied the ANZSPD Executive with a copy of his own personal submission to the ADA (NSW), and it later formed the basis of ANZSPD's submission to the ADA (NSW). ANZSPD's submission to ADA (NSW) and the ADA's fact sheet on the Senate Committee's report are published in full elsewhere in this edition of Synopses. It is clear from the ADA's fact sheet that the major points raised in ANZSPD's submission were endorsed by the Senate Committee.

I encourage members to keep your eyes and ears open for issues affecting paediatric dentistry that need to be addressed and then bring them to the attention of the ANZSPD Executive for action in case we are not already aware of them. We may not be able or want to address every issue that is raised by the membership, but telling us about the issue puts it on the Executive's agenda for consideration. Writing a submission yourself and forwarding it to the ANZSPD Executive for consideration, further increases the likelihood of your concerns being formulated into a formal official ANZSPD submission on the subject.

Once again, I wish all of you a safe and prosperous 2013.



30 October 2012

## **Australian Government Senate: Community Affairs Legislation Committee Report on the Dental Benefits Amendment Bill 2012**

On 20 September 2012 the Senate referred the provisions of the Dental Benefits Amendment Bill 2012 (Bill) to the Senate Community Affairs Legislation Committee (Committee) for inquiry and report by 29 October 2012. The Senate Standing Committees on Community Affairs report on Dental Benefits Amendment Bill 2012 was tabled 29 October 2012.

The report dealt with:

- Closure of the Chronic Disease Dental Scheme
- Replacement of the Medicare Teen Dental Plan
- the consultation with the profession;
- Proposed scope of the Child Dental Benefit Schedule - the details of the services that will be available under the scheme
- Legislative framework for the provision of dental benefits
- the transitional arrangements for those patients currently being serviced under the Chronic Disease Dental Scheme (CDDS); and
- the eligibility criteria for the scheme.

One of the major issues the ADA raised was the need for the new Scheme to provide scope for the treatment of exceptional cases in appropriate circumstances. This was accepted by the Committee.

The Committee view was:

*The committee welcomes the investment generally and is of the view that the levels of funding are appropriate in the current financial climate. With specific regard to the \$1000 cap for treatment over two years under the CDBS the committee believes this to be appropriate. However the committee would also support the establishment of an exceptional cases procedure whereby treatment can be provided under the CDBS, in accordance with strict clinical criteria, in cases where the \$1000 cap would not be sufficient. The committee would envisage the provision of hospital-based dental treatment to be covered under such a procedure.*



In general support for the adoption of the ADA's DentalAccess proposal the Committee also expressed the view:

*The committee agrees with the majority of contributors that the scheme is targeted appropriately at children and will provide long-term health benefits for those that participate in the scheme. The committee also supports the means testing element of the scheme that while agreeing that universal public dental service provision is a long-term goal, adopting a scheme that as a first step attempts to tackle oral health inequality caused by socio-economic disadvantage is the correct strategy. As previously discussed the committee is hopeful that all services required to address children's dental needs will be available, and looks forward to the publication of the children's dental services schedule in the coming months.*

*The committee also looks forward to the outcome of the government's negotiations with the States and territories and hopes that the agreements will ensure that there will be no gaps in service provision for any clinically necessary treatment that commenced under the CDDS.*

The ADA also accepted the new Scheme permitting dental services under the Scheme being provided by dental therapists, dental hygienists, and oral health therapists in accordance with the Dental Board of Australia's Scope of practice requirements. This was designed to address the previous restrictions that had been imposed (but since recently removed) under the DVA Scheme that prevented these practitioners providing services within a structured relationship with the dentist the team leader. The committee stated:

*(It) supports the extension of the role of dental therapists, dental hygienists, and oral health therapists within Medicare.*

The Coalition's recommendations were:

- 1. That support for children should continue through the CDDS until the CDBS is operations*
- 2. That the Government considers extending financial assistance above the cap of \$1000 for children requiring more complex dental treatment as a result of chronic disease.*

The Australian Greens in their report stated:

*(The Australian Greens) share some of the concerns raised about the timing of the new scheme and the delay between the cessation of the Chronic Disease Dental Scheme and the commencement of the CDBS and the National Partnership Agreement.*

## **Robert Boyd-Boland**

Chief Executive Officer

Australian Dental Association Inc.



27th July, 2012

The Executive Officer  
Dental Board of Australia  
GPO Box 9958  
Melbourne Vic 3001  
Email: dentalboardconsultation@ahpra.gov.au  
Re: DISCUSSION PAPER – ANXIOLYSIS (dated 29 November 2011)

The Australian and New Zealand Society of Paediatric Dentistry Inc (ANZSPD) is committed to the study and advancement of paediatric dentistry, and the promotion of education in the field of paediatric dentistry. Membership is open to all ethical dentists who share an interest in advancing the objectives of ANZSPD. As a result, ANZSPD has members who are general dental practitioners, specialist paediatric dentists and other dental specialists (for example, orthodontists). ANZSPD is affiliated with the Australian Dental Association.

Many of ANZSPD's members regularly use forms of anxiolysis / minimal sedation to modify behaviour so as to allow dental treatment on their patients. This use of anxiolysis / minimal sedation reduces members' need to resort to the use of general anaesthesia for behaviour management.

On behalf of its membership, ANZSPD welcomes the opportunity to comment on the discussion paper published on its website by the Dental Board of Australia (DBA). ANZSPD makes the following comments:

1. The definition of anxiolysis in the DBA's discussion paper differs from the definition the DBA has used in its Guidelines on Conscious Sedation Area of Practice Endorsement (04 June 2012). For the sake of clarity, it would be best if the same definitions could be used consistently in all of the DBA's documentation.
2. Dedicated nitrous oxide dental machines used in dental practices generally have TGA approval but not all machines on their own comply with PS9 (2010)<sup>1</sup>. In order to comply with PS9 (2010) (Clause 7.8), some machines need to be used in combination with a separate low gas flow alarm. For example, all mixers currently sold by Air Liquide have TGA approval but only their Matrx MDM<sup>®</sup> Digital Mixer has a built-in low gas flow alarm. The rest sold by Air Liquide need to be used in combination with a separate low gas flow alarm to be compliant with PS9 (2010).
3. Under the definition of anxiolysis that the Dental Board of Australia (DBA) has used in its Guidelines on Conscious Sedation Area of Practice Endorsement (04 June 2012), relative analgesia using nitrous oxide/oxygen on its own and relative analgesia using nitrous oxide/oxygen in combination with local anaesthetic are forms of anxiolysis.
4. According to the author of the DBA's discussion paper, the member societies of the International Federation of Dental Anesthesiology Societies (IFDAS) also regard the use of carefully titrated doses of nitrous oxide with oxygen administered via a dedicated dental machine that meets the professional standards document PS9 (2010) as a form of minimal sedation (anxiolysis).
5. The DBA's discussion paper says that "Dentists offering minimal sedation must ensure that they and their staff are trained in advanced life support to the standards required by the Australian Resuscitation Council and have medical emergency equipment, protocols and procedures set out in practice manuals which are readily accessible." The DBA's discussion paper directs the reader to the Australian Resuscitation Council (ARC) guidelines on its website<sup>2</sup>.
6. The ARC guideline 11.1 states:

"Basic Life Support is the preservation or restoration of life by the establishment of and/or the maintenance of airway, breathing and circulation, and related emergency care. Adjunctive equipment is **NOT** essential for basic life support, however the use of Automated External Defibrillators (AEDs) by persons trained in their use but not trained in ALS techniques is encouraged by the ARC and the NZRC.

Advanced Life Support (ALS) is basic life support with the addition of invasive techniques e.g. manual defibrillation, advanced airway management, intravenous access and drug therapy.”<sup>2</sup>

Sections 11 and 12 of the ARC’s guidelines outline the techniques, drugs, equipment, etc, required to provide advanced life support. In effect, the author of the DBA’s discussion paper is proposing that dentists offering minimal sedation must ensure that they and their staff are trained to use manual defibrillators, place endotracheal tubes, insert IV cannula, administer a range of drugs, including amiodarone if required, and have on hand and use a range of sophisticated medical equipment if required.

7. The DBA’s discussion paper says that “Anesthesia Crisis Resource Management (ACRM) guidelines should be observed and incorporated in to staff training.” The DBA’s discussion paper directs the reader to the (ACRM) website<sup>3</sup>. From what is read on this website, the author of the DBA’s discussion paper is proposing that dentists offering minimal sedation must ensure that they and their staff are trained in advanced life support on a simulator.
8. ANZSPD does not believe that dentists and their staff should have to undergo training and be competent in advanced life support in order to use nitrous oxide / oxygen relative analgesia, nor does ANZSPD believe that some of this advanced life support training needs to take place on a simulator. Only regularly updated basic life support should be required.
9. Patients’ general medical practitioners regularly prescribe sedative drugs for their patients at doses which are no more than the maximum recommended dose of the drug that can be prescribed for unmonitored home use. Will the dentist who wants to do dental treatment with or without local anaesthetic on a patient for whom valium has been prescribed by the patient’s medical practitioner for a generalized anxiety condition be precluded from doing so because the dentist or the dentist’s staff does not have advanced life support training on a simulator and the appropriate equipment for advanced life support?
10. General dentists and specialists currently prescribe sedative drugs for their patients at doses which are no more than the maximum recommended dose of the drug that can be prescribed for unmonitored home use. Will the general dentist or endodontist who wants to prescribe a safe dose of valium for a patient with an anxiety of dental treatment to take at home be precluded from doing dental treatment with or without local anaesthetic on the patient because the general dentist or endodontist or his/her staff does not have advanced life support training on a simulator and the appropriate equipment for advanced life support?
11. ANZSPD does not believe that dentists and their staff should have to undergo training and be competent in advanced life support in order treat patients (with or without local anaesthetic) who have taken a single oral medication for anxiety, provided the dose is no more than the maximum recommended dose of the drug that can be prescribed for unmonitored home use. Nor does ANZSPD believe that some of this advanced life support training needs to take place on a simulator. In these circumstances, only regularly updated basic life support should be required.

Should the DBA’s anxiolysis discussion paper form the basis of anxiolysis guidelines published by the DBA, ANZSPD respectfully recommends that:

1. The anxiolysis guidelines should state: “These guidelines do not apply to dentists using relative analgesia using nitrous oxide/oxygen on its own and do not apply to nitrous oxide/oxygen when used in combination with local anaesthetic.”
2. The anxiolysis guidelines should state: “These guidelines do not apply to patients who have been prescribed a single anxiolytic medication, provided the dose of the anxiolytic medication is no more than the maximum recommended dose of the drug that can be prescribed for unmonitored home use. These guidelines do not apply whether or not the dentist uses the anxiolytic drug in combination with a suitable local anaesthetic.”

ANZSPD trusts that the Dental Board of Australia will consider this input in its deliberations. ANZSPD also wishes to thank the DBA for offering ANZSPD an opportunity to comment on the DBA’s discussion paper and for granting ANZSPD an extension to the closing date for comment.

Yours sincerely,

Dr John M Sheahan  
Federal President ANZSPD Inc.

#### References:

1. PS9 (2010) – Guidelines on Sedation and/or Analgesia for Diagnostic and Interventional Medical, Dental or Surgical Procedures: <http://www.anzca.edu.au/resources/professional-documents/documents/professional-standards/pdf-files/PS9-2010.pdf>
2. Australian Resuscitation Council website: <http://www.resus.org.au>
3. Anesthesia Crisis Resource Management website: <http://med.stanford.edu/VAsimulator/acrm/>



## DISCUSSION PAPER – ANXIOLYSIS

**Definition:** A reduction in anxiety. Although this may be achieved by non-pharmacological means, for the purpose of this paper it is assumed to be achieved via pharmacological means, usually via oral or gaseous drug administration. Anxiolysis may also be termed “minimal sedation.” In the anxiolytic state, although cognitive function and coordination may be slightly impaired, patients will respond normally to verbal commands, and ventilatory and cardiovascular functions are unaffected.<sup>1</sup>

The member societies of the International Federation of Dental Anesthesiology Societies (IFDAS)<sup>2</sup> regards minimal sedation (anxiolysis) as the use of a single low dose oral sedative drug, or the use of carefully titrated doses of nitrous oxide with oxygen administered via a dedicated dental machine that meets the ANZCA/RACDS professional standards document PS9.<sup>3</sup> IFDAS considers that “minimal sedation” includes the term “anxiolysis” to describe the technique of the reduction of anxiety.

**Techniques:** Techniques used for minimal sedation should utilize drugs with a wide margin of safety ensuring that unintended loss of consciousness is unlikely. Drugs used should have a short duration of action (minimal half-life) thereby reducing recovery time and potential post - operative sequelae.

**Equipment** for nitrous oxide mediated sedation should be regularly checked and maintained.<sup>4</sup>

**Precautions:** Dental practitioners intending to use minimal sedation must ensure that patients are healthy (ASA 1 & 2)<sup>5</sup>, have a responsible adult to escort them home and understand the post-operative effects of sedation. Dentists offering minimal sedation must ensure that they and their staff are trained in advanced life support to the standards required by the Australian Resuscitation Council<sup>6</sup> and have medical emergency equipment, protocols and procedures set out in practice manuals which are readily accessible. Anesthesia Crisis Resource Management (ACRM)<sup>7</sup> guidelines should be observed and incorporated in to staff training.

**Recovery:** Patients must not be discharged from the dental office following minimal sedation until they have recovered sufficiently to have regained their normal cognitive functions and coordination. Patients should be discharged into the care of a responsible adult who is available to escort them to, and look after them, in a private setting.

### REFERENCES:

1. Watts J. Safe Sedation for all Practitioners, Radcliffe Pub, 2008.
2. IFDAS: <http://www.ifdas.org/>
3. PS9 – Guidelines on Sedation and/or Analgesia for Diagnostic and Interventional Medical, Dental or Surgical Procedures: <http://www.anzca.edu.au/resources/professional-documents/documents/professional-standards/pdf-files/PS9-2010.pdf>
4. Clark M, Brunick A. Nitrous Oxide and Oxygen Sedation, Mosby, 1999.
5. The American Society of Anesthetists Physical Status Classification: [http://my.clevelandclinic.org/services/anesthesia/hic\\_asa\\_physical\\_classification\\_system.aspx](http://my.clevelandclinic.org/services/anesthesia/hic_asa_physical_classification_system.aspx)
6. ARC: Australian Resuscitation Guidelines: <http://resus.org.au/>
7. ACRM: <http://med.stanford.edu/VAsimulator/acrm/>

Author: Douglas Stewart: [Douglas\\_Stewart@wsahs.nsw.gov.au](mailto:Douglas_Stewart@wsahs.nsw.gov.au)  
29 November 2011





1<sup>st</sup> October, 2012

Dr Jane Pinchback  
Australian Dental Association (NSW Branch) Ltd  
69 Nicholson St,  
St Leonards NSW 2065

Dear Dr Pinchback,

The Australian and New Zealand Society of Paediatric Dentistry Inc (ANZSPD) is committed to the study and advancement of paediatric dentistry, and the promotion of education in the field of paediatric dentistry. Membership is open to all ethical dentists who share an interest in advancing the objectives of ANZSPD. As a result, ANZSPD has members who are general dental practitioners, specialist paediatric dentists and other dental specialists (for example, orthodontists). ANZSPD is affiliated with the Australian Dental Association.

On behalf of its membership, ANZSPD welcomes the opportunity to comment on the Dental Benefits Amendment Bill 2012. ANZSPD makes the following comments based on the background information you supplied on 21<sup>st</sup> September, 2012 in your email to Dr John Winters:

ANZSPD applauds the move to provide targeted funding to the most disadvantaged groups in our society for the oral health care of children. ANZSPD does not understand why the scheme appears to exclude children in the first two years of their life ("children aged at least 2 years but less than 18 years"), particularly as ANZSPD and the Australasian Academy of Paediatric Dentistry (AAPD) endorse the international recommendations for children to commence dental care by the time of their first birthday. There seems to be no justification for the Child Dental Benefits Schedule having a minimum age.

The distribution of oral health issues is not uniform throughout the community. By the time children reach primary school, 50% of them will have experienced no tooth decay at all, and the community's average number of affected teeth in this age bracket is just two. The proposed funding arrangements of \$500 per child per year for each two-year period will clearly serve the needs of the average child. Unfortunately, the worst 10% of children have an average of 10 out of their 20 primary teeth affected by tooth decay and it is this group that is most likely to suffer from chronic pain and sepsis. The funding

arrangements which so adequately meet the needs of the average child will clearly be inadequate to meet the needs of those with the most severe disease.

The proposed Child Dental Benefits Schedule will therefore **systematically discriminate against those children who have the greatest unmet oral health needs**. In order to overcome this anomaly, it is essential that there be some mechanism to override the individual funding cap, and **access additional funding** to meet the needs of those unfortunate children who experience the most severe disease, often at a very young age.

Clearly it is essential that this new scheme does not replicate one of the most egregious flaws in the soon to be closed Enhanced Primary Care scheme. Because the proposed Child Dental Benefits Schedule is targeted at children, and particularly very young children and those children with special needs, or extreme disadvantage, **there needs to be a mechanism to provide access to dental treatment carried out under general anaesthesia in a hospital**. Moreover, patients with private health insurance should also be able to use their insurance to defray the costs of a hospital admission in addition using the Child Dental Benefits Schedule. Moreover, patients with private health insurance should also be able to use their insurance to defray the costs of a hospital admission in addition using the Child Dental Benefits Schedule.

The recent experience of dentists with the Enhanced Primary Care scheme and the enforcement actions implemented over technical compliance issues are likely to make many dentists wary of participating in this scheme. It would be useful if a more constructive dialogue could occur between Medicare and the dental profession, analogous to the comprehensive programme of taxpayer education provided by the Australian Taxation Office around the issues of implementing the GST.

ANZSPD believes that the dental profession should strongly lobby for the full range of dental services to be covered at each practitioner's normal fee, as was the case in the Enhanced Primary Care scheme. Furthermore the "gap" should be eligible for private medical insurance rebate. This is not the case with the soon to be closed Medicare Teen plan.

ANZSPD is concerned that the devil of Child Dental Benefits Schedule will be in its detail. ANZSPD would welcome the opportunity to comment further when the details of the scheme are more developed.

Thank you once again for providing ANZSPD with an opportunity to comment.

Yours sincerely,

Dr John M Sheahan  
Federal President, ANZSPD Inc.



## New Zealand Branch President's Report

*Dr Heather Anderson*

Happy New Year to you all and Best wishes for 2013. I hope you have managed to have a deserving Christmas break with family and friends.

Firstly I wish to thank Mary Anne Costello for her presidency of the NZ branch over the last 2 years. She has been an enthusiastic president and has tirelessly advocated for child and adolescent dental health in New Zealand.

A long-standing member of our NZ branch, Ian Esson was given Honorary life membership at our AGM in November. He has recently retired from his position at the Christchurch Oral Health Centre and there will soon be a new Specialist Paediatric Dentist taking over from him later in the year.

Our 6th Annual Study Day was held in Wellington on 17 November. Our main topic was Controversies in Cleft care in NZ, with some of the team who provide care in Auckland as our invited speakers. Orthodontist Heather Keall's address was about current cleft care in New Zealand and titled 'Snakes and Ladders'. Dr Lance West, Oral and Maxillofacial Surgeon spoke on surgical correction of Class II secondary Cleft Deformity, and speech therapist Mrs Maeve Morrison gave us an insight into her role with 'Diagnosis of Speech Problems in Cleft and non Cleft velopharyngeal incompetence syndromes'. These were very informative presentations. We also had a great historical view of Cleft care in NZ provided by Dr Harvey Brown. Additional speakers included Ian Esson with a report on dental defects related to childhood oncology in Christchurch, Colleen Murray provided a case presentation on a single tooth anterior cross-bite, and Craig Waterhouse gave a summary of some key take home messages from the Sedation meeting in Brisbane.

The NZDA conference will be held in Rotorua this year, August 14 – 17. We are excited to have Dr Eduardo Alcaino confirmed to present there.

Last but not least our dear friend Alison Meldrum has made such a positive recovery from her accident last year that she is now back to full time work. Thank you all for your thoughts and well wishes.



## Federal Secretary-Manager's Report

*Alistair Devlin*

### 2013 PROFESSOR LOUISE BREARLEY MESSER POST-GRADUATE ESSAY COMPETITION

#### TOPIC:

"A severely anxious 10 year old presents for his first dental exam with a sore tooth. Discuss the anxiety reducing techniques and management of this patient"

#### ELIGIBILITY:

Paediatric dentistry post-graduate students from New Zealand and Australia who are currently enrolled in a Doctorate, Masters or a Post-graduate Clinical Diploma in Paediatric Dentistry program.

#### PRIZES:

First Prize: AU\$2,500.00. The winning essay will be published in Synopses

Second Prize: AU\$500.00.

### 2013 PROFESSOR LOUISE BREARLEY MESSER UNDER-GRADUATE ESSAY COMPETITION

The Australian & New Zealand Society of Paediatric Dentistry Inc. is once again holding its Annual Essay Competition open to all dental under-graduates enrolled in an Australian or New Zealand dental school.

A first prize of AU\$1,500.00 will be awarded to the best entry and there will be a second prize of AU\$500.00. The prize winning Essay will be published in Synopses.

The topic for 2013 is: "Discuss the management of the ectopically erupting permanent molar"

Entries for both the post-graduate and under-graduate competitions close with the Secretary-Manager at [devlins@iinet.net.au](mailto:devlins@iinet.net.au) on Monday, 4th November 2013.

More detailed notices regarding these two essay competitions will be sent to all Dental Schools in Australia and New Zealand

# 2012 Louise Brearley Messer ANZSPD Undergraduate Essay Competition Winner

Discuss high risk behavioural factors in adolescents which can contribute to increased decay burden for these young patients.

*Timothy Tay – University of Western Australia*

## Abstract

Tooth decay burden is a result of dental caries – a common finding in adolescents. Dental caries develop due to an imbalance in protective and pathological influences, which modify the proportion of cariogenic bacteria and their environment. These influences, in turn, are determined by a combination of many factors and one of particular concern is high risk behaviour in adolescents. The purpose of this essay is to discuss relevant behaviours in adolescents, which may contribute to an increased risk of dental caries. It will consider behaviours, which have been linked to high caries risk, including: poor oral hygiene and diet, eating disorders, alcoholism and illicit drug abuse. Although most longitudinal studies have found a positive correlation between these behaviours and dental caries, the exact mechanisms by which some of these behaviours increase caries burden is still unclear and should be considered for further research.

## Keywords:

- Dental Caries
- Adolescent
- Oral Hygiene
- Diet
- Eating Disorder
- Substance Abuse

## Introduction

Dental caries is the most prevalent bacterial infection in the world<sup>1</sup>. A study performed by the Australian School Dental Scheme has found that despite the decrease in decayed, missing and filled teeth (DMFT) scores of 12-year-old children from 4.6 to 0.89 between 1977 and 1998, caries prevalence is still common in adolescents<sup>2</sup>. Thus, it is important to understand the factors that can contribute to decay burden in adolescents.

Dental caries results from tooth decalcification caused by bacterial acid production, followed by invasion and destruction of any remaining tissue<sup>1</sup>. Its development requires factors such as: cariogenic bacteria (e.g. *Streptococcus mutans*), bacterial plaque, stagnation areas, fermentable bacterial substrates and susceptible tooth surfaces<sup>1</sup>. These factors can be altered by protective (e.g. saliva flow, good oral hygiene) and pathological (e.g. cariogenic diets) influences which, in turn, are determined by the behaviour of adolescents<sup>3</sup>. In order to understand the relationship between adolescent behaviour and decay burden, one must first understand the parameters of the other two terms: adolescence and behaviour.

There is no standard definition for adolescence but it is universally described

as the period between the onset of puberty and adulthood<sup>4</sup>. Although many factors such as gender and genetics determine the age of onset and duration at which a specific individual goes through puberty<sup>5</sup>, it usually begins between 11 and 13 years of age, spanning the teenage years and terminating at 18 to 20 years of age – prior to the start of adulthood<sup>4</sup>. Erik Erikson, an eminent developmental psychologist best known for his theory on social development of human beings describes this stage as Ego-identity versus Role-confusion<sup>6</sup>. His theory states that adolescence is the most crucial stage of human development where the child has to learn the roles he will occupy in adulthood<sup>6</sup>. During this period, individuals will attempt to form their own identity by experimenting with different types of behaviour in order to 'reintegrate a sense of self'<sup>6</sup>.

This behaviour, that Erikson describes, is defined as the adaptive or habitual response of an individual to express emotions and cope with newly introduced internal and environmental stresses<sup>7</sup>. Behavioural factors may include: self-care, anti-socialism, aggression, eating disorders, pregnancy, alcoholism, smoking, illicit drug abuse and acts of rebellion<sup>8</sup>. However, it must be noted that not all of these behavioural factors count as risk factors for increased decay burden.

Caries Management by Risk Assessment (CAMBRA) is a universally well-accepted concept used to guide the development of treatment plans by identifying specific disease indicators and risk factors of individuals<sup>9</sup>. Behavioural risk factors outlined by CAMBRA include diet, frequent intake of highly fermentable carbohydrate products, poor oral hygiene, causes of poor saliva flow and medications that affect quality of saliva<sup>9</sup>. Therefore, this essay aims to discuss relevant adolescent behavioural factors such as self-care, diet and eating disorders, alcoholism and illicit drug abuse. It will focus on the causes of behavior, related signs and symptoms, and its possible direct/indirect link to increased decay burden.

## Self-care

Simple clinical observation of active carious sites show that caries develops only at the interface between tooth surface and dental plaque in stagnation areas<sup>1</sup>. The cariogenicity of *Streptococcus mutans* depends as much on its ability to adhere to the tooth surface as on its ability to produce acid<sup>1</sup>. Thus, the main objective of oral hygiene is to minimize cariogenic bacterial counts by removing plaque – which contains bacteria, substrates used by bacteria and other components such as glucans that enable



large concentrations of bacteria to adhere to the teeth<sup>1</sup>. Studies have shown that poor oral hygiene is a crucial factor in the development of caries, and for this reason; many caries prevention programs for adolescents aim to improve oral hygiene standards<sup>10</sup>. During adolescence, a majority of individuals will be in the mixed-permanent dentition phase with interproximal contacts often established<sup>5</sup>. Hence, the basis of good oral hygiene lies in adopting proper tooth brushing and flossing techniques twice daily<sup>11</sup>. It has been described by CAMBRA that all patients, regardless of level of risk, must maintain high standards of oral hygiene<sup>9</sup>. Yet, most available data that analyse the prevalence of good oral hygiene practice conclude that a significant proportion of adolescents do not adhere to these guidelines<sup>12</sup>. Studies attempting to determine the cognitive consistency and emotional inconsistency regarding oral health and hygiene have established plausible reasons for this occurrence<sup>13</sup>. These reasons can be split into three main categories namely, awareness of determinants of oral health, emotional relations to oral health and values in oral health<sup>13</sup>.

Awareness of determinants of oral hygiene refers to knowledge regarding: its importance and sequelae, protective and risk factors for oral diseases and proper oral hygiene techniques<sup>13</sup>. This knowledge is acquired through different sources such as home, school, television and dental care – lack of which could possibly hamper the practice of proper oral hygiene<sup>13</sup>. Nevertheless, it is important to realise that knowledge alone does not guarantee good oral hygiene practice<sup>13</sup>. Research has found that although a majority of adolescents acknowledged tooth brushing as the most important determinant for caries, many attributed forgetfulness and lack of time to the main reasons for not brushing<sup>13</sup>. Thus, knowledge and activity levels must lend themselves to one another in contribution towards higher standards of oral hygiene<sup>13</sup>.

The next plausible reason for poor oral hygiene standards is emotional relations to oral health<sup>13</sup>. Results of interviews conducted on adolescents with high caries risk placed their attitudes towards oral health into three categories – positive, impassive and negative<sup>13</sup>. The majority of the group, however, fell into the categories of impassiveness and negativity<sup>13</sup>. Those in the impassive group expressed no

concerns regarding their oral health and assumed that the dentist could take care of all their oral health requirements<sup>13</sup>. Those with negative attitudes were characterized by frustration, feelings of loss of control over their oral health, and a tendency to give up<sup>13</sup>.

Last but not least, this same study found that the values an adolescent placed on oral health strongly influenced oral hygiene standards<sup>13</sup>. Survey statistics showed that respondents that placed a higher value on appearance and function such as fresh breath, white teeth, social value, unhindered speech and mastication, demonstrated higher standards of oral hygiene<sup>13</sup>.

Although it is clear that a multitude of factors determine the overall outcome of a child's oral hygiene standards, it is difficult to argue which component of the factors discussed have a higher weightage and this needs to be ascertained to pinpoint the problem. Nevertheless, available evidence demonstrate that maintenance of a carious-free dentition cannot be achieved by high standards of oral hygiene alone and must marry other important factors such as quality and quantity of diet<sup>12</sup>.

## Diet and Eating Disorders

The nutritional needs of a child increase significantly during adolescence because of pubertal growth spurt and body composition changes<sup>5</sup>. This coincides with other factors that affect their overall nutritional choices such as: independence, peer influence, increased school and/or sport activities, self-image and knowledge from parents and professionals<sup>14</sup>.

Results from population-based surveys concur that the average adolescent consumes a higher proportion of sugar than the recommended daily value<sup>15</sup>. This is important to the dentist because there is a well-established correlation between sugar intake and prevalence of dental caries, making it one of the risk factors outlined by CAMBRA<sup>9</sup>. Sucrose-rich diets favour the progression of caries in two ways<sup>1</sup>. First, sucrose acts as a substrate for *Streptococcus mutans* to produce glucans, insoluble plaque polysaccharides essential for bacterial adhesion and colonisation<sup>1</sup>. Second, increased frequency of consuming foods that contain highly fermentable carbohydrates favours rapid and regular diffusion of sucrose into plaque, allowing for cariogenic bacteria to

produce acid<sup>1</sup>. This will result in the prolonged maintenance of an oral pH below the critical pH<sup>1</sup>. It has been established that a drastic reduction in dietary sucrose is followed by virtual elimination of *Streptococcus mutans*, leading to reduced or abolished caries activity<sup>1</sup>. In addition, these problems are made worse by the fact that many sucrose-rich foods contain extrinsic acids like citric acid, resulting in dental erosion and increased susceptibility to further acid attacks<sup>16</sup>. Thus, it is important to look at the factors affecting adolescent nutritional choices, which can contribute to increased sugar consumption.

The first factors to be discussed are independence and peer influence. In line with Erikson's theory of human development, adolescence is a time of seeking independence, leading to increased mobility and greater autonomy over finances and food choices<sup>17</sup>. In concert with this is the increasing influence peers have over decision-making<sup>17</sup>. The amalgamation of its effects can be seen in the results of a survey conducted to determine the 'Influences on consumption of soft drinks and fast food in adolescents'<sup>17</sup>. This survey found that taste, convenience, price and company contributed greatly towards the consumption of sugar-laden fast foods and soft drinks<sup>17</sup>. All of which are in line with independence and peer influence.

Another trend observed in adolescents is the increase in consumption of sports drinks<sup>18</sup>. Population studies performed in the United States found that over 20 per cent of high school children consumed at least one sports drink a week<sup>18</sup>. One possible explanation for this trend is that more youths are actively participating in sports, after which, energy levels need to be replenished<sup>18</sup>. These drinks often contain citric acid and have high sugar content and its effects have been elaborated above<sup>18</sup>. This is further compounded by the fact that sports drinks are often consumed soon after exercise, a time when saliva flow is low<sup>19</sup>. Saliva is important in both clearing cariogenic foods and acting as a natural buffer for acids<sup>19</sup>. Its effectiveness diminishes as flow rate is reduced<sup>19</sup>.

The next factor to discuss is the effect of school and workplace. These can be very stressful environments and one of stress' manifestations is seen in the form of emotional over-eating<sup>20</sup>. Emotional over-eating is defined as the inability of an individual to control quantity, quality

and frequency of food consumed when faced with negative emotions and its symptoms include a combination of the following<sup>21</sup>:

1. Sudden onset of cravings.
2. Triggers to very specific cravings that are dependent on the individual and situation.
3. Boredom prompts salty cravings while sadness triggers sweet cravings.
4. Subsequent feelings of guilt<sup>21</sup>.

Many teenagers resort to emotional over-eating as a coping mechanism and studies have found that greater reported levels of stress lead to both, more ineffective attempts to control eating, and an increased frequency in consumption of palatable non-nutritious food<sup>20</sup>. In addition, stress, anxiety and low self-esteem in adolescents often come associated with other high risk behavioural factors such as poor oral hygiene standards etc., multiplying ones risk of caries<sup>22</sup>.

Another type of behaviour related to diet is dieting. During puberty, self-image and self-esteem are important components of the development of personal identity and individuals may be pressured into adopting the latest diet trends with no sound knowledge of its consequences<sup>23</sup>. A study performed in Qatar to determine the prevalence of dieting in adolescents has produced some shocking statistics<sup>24</sup>. Out of all the subjects in the study, almost half the sample dieted, although 66 per cent of those on diets were not overweight to begin with<sup>24</sup>. Dieting is not without consequences and when taken to the extreme, may result in eating disorders<sup>25</sup>. A study conducted to ascertain the relationship between these two factors has found that dieters are two to three times more likely than non-dieters to develop eating disorders over 5-year follow-ups, with extreme dieters at an even higher risk<sup>25</sup>. One eating disorder, bulimia nervosa, is of particular concern. Bulimia nervosa is characterized by recurrent and frequent episodes of eating unusually large amounts of food followed by purging behaviour such as emesis, fasting, or excessive exercise<sup>26</sup>. Bulimic patients are associated with a higher caries risk and three explanations have been suggested<sup>26</sup>. First, the increased frequency of eating results in an increase in number of sugar exposures and the consequences of this has been discussed. Even though an individual manages to

purge food from the body, this number remains unchanged. Second, the products of emesis are low in pH and this intrinsic acid source can cause erosion of the enamel, increasing the tooth's vulnerability to subsequent bacterial acid attacks. Thirdly, frequent vomiting may cause destruction to salivary glands, which may lead to xerostomia and reduce saliva's protective capacity<sup>26</sup>.

The nutritional status of an individual is strongly impacted by dietary beliefs and attitudes of family members and anthropologists have concluded that human habits are formed early in childhood<sup>27</sup>. It has been found that adolescents snack more frequently on non-nutritive foods when parents exercise little or no control over their diets<sup>14</sup>. In addition, individuals may be misguided by the health benefits of certain foods and fail to recognize the implicated risks. One such example is fruit juice consumption<sup>28</sup>. Although fruit juices boast a wide range of health benefits, its acidic nature and high sugar content can produce similar dental effects to those of sports drinks<sup>28</sup>.

Hence, it can be seen that factors affecting an adolescents dietary choices plays a crucial role in the progression of dental caries. Although these factors can be linked to increased decay burden via frequency of sugar exposures, its precise impacts are still inconclusive. Many of these factors can be modified and need to be promptly dealt with via a collaborated multidisciplinary approach, which may include the services of psychiatrists, psychologists, nutritionists, gastroenterologists and dentists<sup>25</sup>.

## Alcohol and Illicit Drug Abuse

Alcoholism can be defined as 'a primary, chronic disease with genetic, psychosocial, and environmental factors influencing its development and manifestations'. Its diagnosis includes a combination of<sup>29</sup>:

1. Prolonged period of frequent, heavy use.
2. Inability to control drinking when initiated.
3. Physical dependence manifested by withdrawal symptoms during periods of abstinence.
4. Tolerance with a need to consume increased amounts of alcohol to achieve similar effects.
5. Social and/or legal problems arising from alcohol use<sup>29</sup>.

Categorised as a drug, it is widely used among adolescents both above and below the legal age limit<sup>30</sup>. In Australia, nearly 50 per cent of 14-19 year olds drink alcohol at harmful levels and the reasons for this include: easy access and curiosity, thrill, boredom, peer pressure, addiction and desensitization of sensory pathways – all of which have varying degrees of contribution depending on population characteristics<sup>30</sup>. This is important from a dental perspective because some studies show that alcoholic adolescents have a caries prevalence rate of at least double the national average<sup>31</sup>.

Another common form of drug abuse among adolescents is the use of illicit drugs such as cannabis<sup>30</sup>. Cannabis is the most widely used illicit drug in Australia and an estimated 17.6% of Australian children under 14 reported using cannabis in the previous 12 months<sup>30</sup>. Cannabis abuse is similar to alcoholism in many ways. Firstly, the reasons for cannabis abuse among adolescents are almost interchangeable with alcoholism<sup>30</sup>. Second, studies find that cannabis abusers generally have an increased risk of dental caries<sup>32</sup>. Thirdly, the psychological and pathophysiological impacts of both drugs on caries are very similar and these impacts require further discussion<sup>31</sup>.

Substance abuse can cause major psychological alterations to ones personality<sup>31</sup>. Studies have found that drug abusers are more likely to experience: apathy and neglect, desire to be isolated and increased stress levels. These in turn, can have detrimental effects on their oral health. The abuser might take a reduced interest in keeping up with strict oral hygiene standards and/or seeking regular dental care. In addition, neglect and increased stress levels can cause one to make poor dietary choices – leading to higher sugar exposures<sup>31</sup>. The impacts that both oral hygiene and diet have on decay burden have been discussed previously.

Pathophysiological changes from substance abuse include, but are not restricted to: weak and short-term memory, impaired attention span, confused perceptions and oral manifestations. Impaired cognitive function from substance abuse may result in the inability to remember, understand and/or accept dental advice provided – leading to increased noncompliance and thus, a higher risk of caries<sup>31</sup>. Although the pathophysiological effects of substance abuse on teeth have not been examined in detail, two effects that may indirectly affect

decay burden have established<sup>31</sup>. First, alcoholics are at risk of dental erosion because alcohol consumption has the potential for increasing the degradation rate mechanisms. Compounding to this is the increased episodes of emesis that follow alcohol abuse<sup>33</sup>. The second effect is related to saliva flow rate. Both alcohol and cannabis have been shown to significantly reduce saliva flow rate that can make one more susceptible to caries<sup>31</sup>.

The use of alcohol and cannabis in Australia is on the rise and oral health care providers are likely to encounter patients that are regular users<sup>31</sup>. Although it is not ground breaking news that these substances can have negative impacts on ones dentition, the significance of psychological and pathophysiological effects described above are unclear. Recent results on animal studies show that rats on alcoholic diets experience both, higher *Streptococcus mutans* counts and smooth surface caries<sup>34</sup>. This, however, is difficult to prove on humans due to ethical and resource limitations.

## Conclusion

To conclude, it can be seen that there is substantial evidence suggesting a link between behavioural factors in adolescents and decay burden. This essay has attempted to consider the consensus of available studies, which demonstrate a positive correlation between these behaviours and dental caries. However, the exact mechanisms by which some of these behaviours increase caries burden is still unclear and should be strongly considered for further research. Apart from diagnosis and treatment of oral diseases, a crucial role held by the oral health practitioner is the education of adolescents and parents on risk factors that can predispose an individual to dental caries<sup>35</sup>. In addition, the dentist must strongly emphasize that avoidance of risk factors alone is insufficient and regular prophylaxis by dental personnel is still essential for patients to maintain high levels of oral hygiene<sup>35</sup>.

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## Western Australia Branch News

The final meeting for 2012 was the Annual General Meeting and Dinner, which was held at the Must Winebar in the Perth suburb of Mount Lawley. At the Annual General Meeting which preceded the Dinner, the same Office Bearers were re-elected - Carmel Lloyd as President, Peter Readman as Vice President, Tim Johnston as Federal Councillor and Alistair Devlin as Secretary-Treasurer.

After the Dinner, members and their partners enjoyed a presentation: "Kids in the Kimberley". This was delivered by orthodontist, Dr John Owen, his wife, Mrs Jan Owen and Dr John Winters and this provided a fascinating insight into the Kimberley Dental Team. The KDT was established following a visit by the Owens to Halls Creek in 2009, and it has become a strong entity which provides dental education and treatment to the local people of the Kimberley. All of this is done by volunteers and it is done in concert with the WA Government Dental Health Services, the Centre for Rural and Remote Oral Health at the University of Western Australia and the Aboriginal Medical Services. John Winters has been one of the volunteers - his own attraction to the Kimberley region of Western Australia goes back to his days as a newly-graduated dentist when he was stationed in the town of Derby. The three speakers were able to show the remarkable achievements of the KDT in the three years since it was established, and this was well illustrated by some magnificent photographs of this intriguing part of the world. Readers may wish to visit the website: <http://www.kimberleydentalteam.com> At the conclusion of the presentation, Branch President Carmel Lloyd thanked the speakers and congratulated them on their worthy initiative. She also took the opportunity to hand over a financial donation from the Branch to the Kimberley Dental Team.

The program for 2013 will get underway in late February when Dr Mike Harrison will be visiting Perth. Mike is from Guys' and St Thomas's NHS Trust/King's College in London and has been appointed by the University of Western Australia as the A.J. Herman Fellow for 2013. In addition to his activities at the University, he will be speaking at a dinner meeting arranged by the Branch.

Once again, the Branch will be conducting its Mid-Winter meeting at the Bunker Bay Resort which is at the gateway to the Margaret River region in the south west of the state. This will be on Friday-Saturday 12th and 13th July 2013. The main speaker will be Winthrop Professor Nigel King.

*Dr Alistair Devlin*

## South Australia Branch News

Following from the success of ANZSPD SA's 2011 programme including the Uluru conference and well attended dinner meetings, 2012 was another strong year for membership.

The activities of the SA Branch in 2012 were centred on the dinner meetings, which were all very well attended. A/Prof Sam Gue spoke about and illustrated "Syndromes with Dental Significance". Prof Jane Scott presented to us on "Early Childhood Feeding Practices and Oral Health", reviewing the evidence for any role of breastfeeding in the initiation of dental caries. The results of the NHMRC grant study that Prof Scott is carrying out in conjunction with the Australian Research Centre for Population Oral Health may add to the present limited evidence on the topic. Thanks to A/Prof Sam Gue, Dr Michael Malandris, and Dr Manjara Packianathan, we were able to see some case studies and discuss management of oral trauma in children. Dr Ninna Estrella, a newly arrived paediatric dentist from the USA who is residing in Adelaide until 2016, finished our year with an intriguing presentation on her experiences from Michigan, where she worked as Clinical Assistant Professor at the University of Michigan, Ann Arbor as well as Director of Paediatric Dentistry Services at C.S. Mott Children's Hospital. We are also delighted with the contributions of the postgraduate students at all of our meetings.

It has been an outstanding success for us to have the involvement and interest of the undergraduate dentistry students in our meetings; we were told that ANZSPD is one of only a few study groups or dental societies in South Australia that welcome students and they have found the dinner meetings very welcoming and their interest in Paediatric Dentistry has been enhanced. We also welcome members to bring along guests to the meetings and we have had the companies of dental therapists, oral health therapists, and postgraduate students in diet and nutrition.

In SA, we have an exciting program ahead of us in 2013 – on 5th March Ms Virginia Hill is speaking to us on "Oral and Speech Development"; 7th May Dr Damian Chan is giving a presentation on "Common Allergic Reactions in Childhood"; 6th August Ms Angela Coppi will talk about "Families Coping with Their Autistic Child"; and our meeting on 15th Oct will include various case presentations and discussion on "First Permanent Molars in Childhood – dealing with caries, hypomineralisation, impaction and other challenging situations". If you are interested in joining us at our meeting, please contact our secretary for more details.

The "Biennial" ANZPSD meeting will be held in Adelaide in 2015 (delayed due to the upcoming RK Hall tour being held in February/March, 2014). Suggestions and ideas are more than welcome. Preparations are already underway!

*Dr Wendy Cheung*



## Victoria Branch News

The ANZSPD Victorian branch had an eventful year in 2012. Our program commenced with our annual Des Crack prize presentation and lecture meeting on the topic of "Understanding Autism". It was held on the 25th of February and featured a range of medical, dental and allied specialists. This event was well attended and received favourably by members of the dental and medical profession. On the 20th of October, the Elsdon Storey Memorial Lecture featured a dynamic and interactive session on "Treatment planning – same case, different perspectives" by Dr Eduardo Alcaino who was supported by presentations from Clinical Associate Christopher Olsen, Dr John Sheahan and Dr Jemima Roberts. We were also privileged with special presentations of the late Professor Elsdon Storey's paintings by his family to Emeritus Professor Louise Brearley Messer AM and Professor David Manton – our past and present holders of the Elsdon Storey Chair of Child Dental Health.

Picture 1: Professors Brearley Messer and Manton with paintings presented by Mrs Patricia Storey

The ANZSPD Victorian Branch and Professor Paul Schneider were honoured to celebrate Emeritus Professor Louise Brearley Messer's appointment as a Member of the Order of Australia (AM) in the 2012 Australia Day Honours. An afternoon tea reception was held on Saturday the 10th of November at the Melbourne Club. It was well attended by her colleagues, past and present students – who were all delighted to acknowledge her achievements and contributions to the field of dentistry.

Picture 2: Dr John Sheahan (ANZSPD Federal President) and Professor Brearley Messer at the Melbourne Club for her afternoon tea reception

In 2013, the ANZSPD Victorian Branch will feature two Saturday lecture meetings and a dinner meeting. Our first event for 2013 will be held on the 16th of February with the topic of "Infant and toddler development" to be presented by paediatrician Dr Bronwyn Cathels, and a selection of our young paediatric dentists will cover a range of topics under the title of "Toothy Matters for Bubs and Tots". On the 13th of August, a joint dinner meeting will be held with the Australian Society of Orthodontists (Victorian Branch) with presentations on "Them murky molars-orthodontic and paediatric considerations in the management of MIH". This will be followed by our final event on the 19th of October with the Elsdon Storey Memorial Lecture and Annual General Meeting. The topics for this day are "Paediatric lumps, bumps and everything in between" and "Double troubles: tongues and thumbs".

*Dr Evelyn Yeung*



Picture 1: Professors Brearley Messer and Manton with paintings presented by Mrs Patricia Storey

## Queensland Branch News

The Queensland branch had another successful year in 2012. The year began with our highlight, our clinic day entitled "A Symposium of Paediatric Dentistry" held on 9 March and co-hosted with the University of Queensland. The speakers, Professor Laurie Walsh, Ms Kathryn Plonka, Ms Margaret Pukallus and Professor Kim Seow delivered a comprehensive update of early childhood caries and shared the latest findings of the caries research program at UQ. Feedback from some of the 250 attendees, was that it was a tremendous success, enjoyed by all.

A new committee was elected at our AGM, with our new president being Dr P Y Lai. The year saw a change in venue (Era Bistro at South Brisbane) and a variety of high quality speakers throughout the year including Dr Gavin Lenz with an overview of lingual orthodontics, Dr Christopher Ho with an outline of current practice in the management of Cleft Lip and Palate, Dr Gregory Ooi and Dr Stephanie Salanitri with a presentation of their current research and Professor Nigel King with his thoughts on the use of MTA in primary teeth.

Our membership is likewise steadily increasing, with a continuing revival of our local branch over the past few years. This year promises a continuation and development of our branch. I wish to thank our president and our committee members for their continuing work and support throughout the year.

*Dr Steven Kazoullis*



Picture 2: Dr John Sheahan (ANZSPD Federal President) and Professor Brearley Messer at the Melbourne Club for her afternoon tea reception

## New South Wales Branch News

2012 was a big year for the ANZSPD NSW Branch, with our regular dinner meetings along with the fantastic Biennial Conference held in Canberra.

The popular half-day Clinical Update was held in March, and had a theme based around multi-disciplinary management of the medically compromised child. There were talks on Haematology, Gastroenterology, Functional Pain Syndromes in Adolescents and a suturing workshop.

In May, Professor Ali Darendeliler gave us a great talk on the past, present and future of Invisalign including several interesting cases highlighting the possibilities of this rapidly expanding area of Orthodontics.

In October, Dr Sarah Raphael, our long-standing member and Scientific Advisor to Colgate gave a talk on contemporary approaches to prevention, with a particular focus on fluoride modalities. It was a great update on products available to both professionals and our patients, and the evidence behind particular fluoride modalities.

The highlight for the NSW Branch during the year was definitely the ANZSPD Congress in July. Many of our members put in an enormous amount of effort to help make this a success. The lecture program was informative and entertaining and the social events were a blast – with the stand-out being the dinner in the wonderful surrounds of the Portrait Gallery.

I would like to make a special mention of Prof. Richard Widmer, outgoing president of the NSW Branch, for running the show in NSW for several years and especially for his rather large part in the wonderful success of the Conference in Canberra. Dr Charles Daniels remains Treasurer and we thank him for his contribution. We would like to extend a warm welcome to Dr Chinh Nguyen as the new President, along with our committee members for 2013 – Dr Ronny Marks, Dr Kareen Mekertichain and Dr Mary Moss.

We have a lot to look forward to in 2013, with dinner meeting speakers including Dr Nour Tarraf and Dr Ronny Marks (Orthodontists), Dr Gillian Dunlop (ENT) and for the half-day clinical update we are very lucky to have the well known Paediatric Dentist Professor Marcio Da Fonseca over from the USA, along with Dr Stephen Duncan (Orthodontist) giving lectures on multidisciplinary management of children with missing teeth.

*Dr Rebecca Eggers*

# *The 24th IAPD 2013 SEOUL*



# Impact of the Rotary Australia-Vietnam Dental Health Project (RAVDHP) in two rural villages in Vietnam

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James A Robertson BDS, BA, MA, MPH, FRACDS, FICD, FADI

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## Abbreviations

RAVDHP = Rotary Australia-Vietnam Dental Health Project

NHOS = National Hospital of OdontoStomatology

dmft/DMFT = decayed, missing and filled primary teeth/decayed, missing and filled permanent teeth

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## Abstract

**Background:** The aim of this qualitative study was to examine community oral health awareness of children and to evaluate the impact made by the Rotary Australia-Vietnam Dental Health Project (RAVDHP) in two rural provinces in Vietnam.

**Methods:** Three target groups (8 teachers, 9 parents, 5 dental staff) were interviewed (total 22 informants), followed by thematic analysis of recurrent and varied perspectives.

**Results:** Barriers to child dental health in rural areas were found to be: ready availability of sweets in and near schools; lack of child and parental awareness of oral health; limited health education beyond primary school and lack of regular dental check-ups in schools; lack of dental staff, resources and infrastructure; oral health disparities between city and rural areas, and lack of community water fluoridation. Although generous and very positive feedback was given on the impact of the RAVDHP, understanding of the scope of humanitarian aid was limited.

**Conclusions:** Education appeared key to building oral health awareness. Teaching of oral health must include practical components, continue across all school year levels, and reach not only children but also adults in the community. Cooperation between departments of

health and education, central hospitals and rural schools is required to promote oral health of children and the wider community. Increased funding is needed to overcome current oral health barriers of limited infrastructure, resources and rural workforce. Programs implemented by overseas humanitarian aid must be directed towards independence, becoming self-sustainable by local rural communities.

## Introduction

The Rotary Australia-Vietnam Dental Health Project (RAVDHP) has been providing dental services, mainly restorative care for 12-year-old school students, and broader oral health promotion to children in rural Vietnamese provinces since 1991. The aims have been to improve their long-term oral health and make a lasting difference to the provision of dental care.

The oral health of over 500 school children aged 11-16 years and pre-school children aged up to 71 months in several rural villages in Vietnam has been studied as a nested component of five RAVDHP visits (2007-2011), evaluating oral hygiene practices and dietary habits in relation to dental caries experience.<sup>1-5</sup> The prevalence of caries was very high, affecting 94-96% of children (mean DMFT  $4.1 \pm 2.4$ ).<sup>1</sup> Mean DMFT scores increased with increasing frequency of daily consumption of

sweet drinks and foods.<sup>3</sup> An abundant supply of inexpensive sweet drinks, sweet flavoured milk and sweet foods, many aimed at consumption by children, was noted, including in school canteens.<sup>5</sup> The studies have highlighted the urgent need for professional dental care and preventive measures, including moderation of intake of dietary sugars and oral health education among these children. To date, quantitative studies have been conducted. The RAVDHP has identified added benefits from a qualitative study of community perspectives in order to support the quantitative outcomes and aid future oral health promotion.<sup>6,7</sup>

The aim of this study was to examine community oral health awareness and the contributions of the RAVDHP to oral health of children in two rural provinces in Vietnam, in order to reinforce the impact of the Rotary team and to assist in identifying future directions to promote awareness of oral health of children in these provinces.

## Participants and Methods

The study was conducted with ethics approval (Health Sciences Human Ethics Sub Committee, University of Melbourne), and in accord with the National Health and Medical Research Council guidelines. Semi-structured interviews were conducted over two weeks (March 3-18, 2012) in two rural

locations in southern Vietnam: Phu Giao District Health Centre in Binh Duong Province (week 1), and Tan Hiep District Hospital in Kien Giang Province (week 2). Both locations had been visited by the Project during 2008-2011, providing oral health care and promotion.

Purposive sampling<sup>8</sup> was used, selecting three groups for interview to gather varied perspectives: teachers (n = 8), parents (9) and dental staff (5). The 22 informants were distributed as: Phu Giao: 5 teachers, 4 parents, 1 dental staff; Tan Hiep: 3 teachers, 5 parents, 2 dental staff; 2 dental staff from the National Hospital of Odontostomatology (NHOS) were interviewed also. Informants were selected on an individual, 'as available' basis. Rotary team members assisted in identifying suitable participants in association with clinical sessions in each District Health Centre.

Each interviewee was given a combined plain language statement and informed consent form in Vietnamese. The form was developed in English by the authors, translated into Vietnamese then back-translated into English by two different translators fluent in both languages. Questions on informed consent and the project were answered through a Vietnamese interpreter prior to the interview. Each interview contained 6-7 semi-structured, open-ended questions, exploring views on oral health awareness of children, the impact of the RAVDH Project on oral health of children in these provinces, and future directions and challenges. All those recruited and invited to be interviewed agreed to do so. Interviews were conducted by the author (SL) with an interpreter – a team member fluent in both English and Vietnamese. All answers were handwritten then transcribed; no recording device was used. No respondent was identified. Transcripts were studied using thematic analysis, grouping responses by themes to identify common trends.<sup>9</sup>

## Results

### Teacher interviews

Responses of the 8 teachers interviewed to 6 questions were collated as follows:

**Question 1 (teachers):** Is there an oral health promotion program currently running at your school? Tell me about it, e.g., frequency, progress, level of engagement and enthusiasm of children.

The teachers all taught 12-year-old

students, and indicated a lack of oral health promotion in their schools. Oral hygiene instruction was limited to reading out information from a dental brochure in school assembly; there was no practical demonstration or follow-up of any kind. Some primary schools conducted regular oral hygiene sessions with tooth-brushing instructions and fluoride mouth-rinsing, but these did not continue in junior or senior high schools. The local government ran a bi-annual dental health check-up program in junior high schools for oral health data collection. Check-up results generally did not reach the teachers or parents; even if notification was sent to parents of their children's dental needs, schools did not ensure treatment was sought. The primary school subject named 'Community and Citizens Behaviour', taught basic health concepts with little focus on dental health. One teacher added that the subject content was controlled by the Department of Education, and changes in the oral health component would have to be achieved through combined efforts of the local government and schools.

**Question 2 (teachers):** What changes have you noticed as a result of oral health promotion at school?

None of the teachers was able to perceive any changes as a result of oral health promotion at school, due to the current lack of such an educational program. Even if verbal instructions were provided on healthy dental habits, practical reinforcement and follow-up schemes were lacking at school.

**Question 3 (teachers):** Have you heard about the Rotary Australia-Vietnam Dental Health Project? Tell me about it.

Seven teachers were familiar with the Project as their schools had participated for several years. The common understanding was that a group of Australian and Vietnamese dentists visited rural districts annually to provide dental check-ups, treatment and education for school children who were screened previously and pre-selected by a local dentist visiting their school. One teacher added that the Australian dentists were known to be very gentle and kind towards children. None of the teachers knew other details – their duties were simply to escort and care for the students on the treatment day and did not include further interactions with the team.

**Question 4 (teachers):** Do you think the Project has had an effect on oral health of children in this community?

All teachers mentioned the positive impact the Rotary Project had on oral health of children in their communities. Customarily, following the government-organised bi-annual dental check-ups at school, teachers, parents and students were not advised of the results, and were therefore unaware of treatment needs. In the absence of family-initiated regular dental check-ups, oral diseases could only worsen and treatment was sought only for pain relief. In contrast, the Rotary team provided students with actual treatment needed and taught them practical ways to improve oral health, which were perceived to be more beneficial than providing only a check-up.

All teachers spoke highly of the standard of work done by the Rotary team. Some students had received treatment by the team two or three times previously and now had improved dental habits. The restorations placed were thought to be superior and long-lasting. Education by the team was perceived to have equipped children with good skills to practice and maintain healthy teeth. The Vietnamese students especially loved interacting with the Australians.

One teacher emphasized the shock of realising the dental disease among the children and their high treatment needs. Only after the work of the Rotary team did teachers and parents become aware of the children's poor oral health. For example, one parent was in disbelief when told by their child that 10 decayed teeth had been restored; they were unaware any fillings were necessary. This became a serious wake-up call for both teachers and parents to become active promoters of oral health in the community. Despite many positive remarks about the Project, teachers also noted that only a limited number of students had the opportunity to receive treatment, representing a small proportion of all the eligible 12-year-old students; those in all other year levels would also benefit from check-ups, treatment and education.

**Question 5 (teachers):** What do you think needs to be done to incorporate oral health promotion into education?

All teachers emphasized the need for increased oral health education at school. While students seen by the



Rotary team received dental treatment and knowledge to maintain healthy teeth, a vast number of children did not get this opportunity – less than 10% of the school population was selected for care. To increase oral health awareness, the government and the central dental hospital would have to include oral health into the school subject, ‘Community and Citizens Behaviour’. In addition to teaching theoretical concepts, practical demonstrations, topical fluoride application and follow-up programs would also benefit students. One teacher suggested training a school nurse for this role. Another teacher noted that, unlike primary school where there was much flexibility in teaching, junior and senior high schools had more rigid academic curricula with a heavy focus on core subjects such as literature, mathematics and science. Ongoing reinforcement of oral health across all school levels was seen as important, otherwise healthy habits would be forgotten.

The teachers made several suggestions to maximise oral health education. Training more teachers with oral health knowledge would help raise awareness among students not treated by the Rotary team. Continuing oral health education through all school levels, incorporating interesting games and activities into oral health lessons would be effective for younger students, and promoting oral health through the increasingly-accessible media (television, internet, newspapers), would be effective means of reaching the population with important health messages.

**Question 6 (teachers):** Do you think oral health of children in this community could be improved? If yes, please explain.

All teachers expressed the need for oral health improvement of children. A recurring problem appeared to be the lack of education. While most kindergartens had a daily tooth-brushing program, primary schools usually taught theory only and the focus on oral health was less at junior and senior high school levels. By the time students were examined by the Rotary team, their teeth already required fillings. Some parents enforced healthy diet and brushing habits but children still consumed large amounts of sweets outside the home. Including interactive activities in ongoing education would be an effective way to reach children. To achieve this, both government funding

and the current dental curriculum in schools would need to be expanded. One teacher noted the importance of educating not only children but also parents and older adults. Some families lived in poor conditions where dental health was not a priority. Promoting oral health through distributing health brochures would help raise community awareness. Another teacher suggested employing more dental staff; only one dentist to look after dental health of all in the district was not sufficient.

#### Parent interviews

Responses of 9 parents interviewed to 7 questions were collated, as follows:

**Question 1 (parents):** How is oral hygiene done for your child at home?

Regardless of age, most children brushed their own teeth with a tooth brush and toothpaste. Types of tooth brush and toothpaste were not mentioned; one parent said they bought ‘sweet’ toothpaste for their child but did not know if it contained sugar. Tooth-brushing frequency was usually 2-3/day. No parent mentioned inter-dental cleaning such as flossing. Some parents encountered problems in promoting tooth-brushing to their children – laziness and tooth-brushing dislike appeared main reasons beyond parental control. One parent said their child had painful bleeding gums, making her rinse with salty water instead of brushing. While aware of tooth brushing benefits, parents could not force their child to do something that would be painful.

Parental input appeared key to teaching and assisting children to develop brushing habits. Most parents taught their children to tooth-brush independently after age three years; others continued to assist brushing directly until the child was older. One parent was ignorant of regular tooth-brushing until the child turned three. Kindergarten also had a role in development of tooth-brushing habits – parents paid a fee for the purchase of tooth brushes and toothpastes for a program where teachers provided direct and indirect brushing assistance after meals. Such practical programs usually did not continue into primary and secondary schools.

Parents described their perceptions of children’s attitudes towards oral hygiene. Tooth-brushing was a fun daily activity for some; one parent described

it as their child’s absolute priority before leaving for kindergarten in the morning. Another parent said their older children were good oral health role models for younger ones, who naturally observed and followed their older siblings’ good oral hygiene habits.

**Question 2 (parents):** In what way do you think oral hygiene has an effect on your child’s teeth?

All parents had a general understanding that oral hygiene played an important role in maintaining dental health and that regular tooth-brushing prevented cavities and made teeth stronger. If oral hygiene was poor, teeth would weaken and form cavities. One parent thought tooth-brushing would have no effect on already decayed primary teeth; only after eruption could the new adult teeth be maintained clean and healthy.

**Question 3 (parents):** Do you think diet has an affect on your child’s teeth?

From the media or common knowledge, all parents thought that sweet treats and soft drinks destroyed teeth and caused cavities. All thought it was necessary to reduce sugar intake in daily life by reducing purchase of sweets or restricting their children’s sugar intake to special occasions only. One parent made their children rinse with water or brush their teeth after eating sweets to reduce the negative effect of sugar. However, controlling sugar consumption outside the home without parental presence appeared difficult – children had easy access to sweet snacks and soft drinks offered by friends and relatives or bought from sweet shops located within or near their school. One parent noted the ready availability of sugar-containing foods such as sweet buns as popular breakfast items, and coconut candy as a famous local product. One parent knew that eating a balanced diet with adequate amounts from each food group was beneficial for health. However, controlling this was difficult as children would eat only what they liked. Another parent described a role for calcium in strengthening teeth, suggesting milk and crabs as specific calcium-rich items.

**Question 4 (parents):** Have you heard about the Rotary Australia-Vietnam Dental Health Project? Tell me about it.

Only two parents had heard previously of the Project; the team visit in 2012 was the first encounter with the Project for seven parents. None of the parents

knew specific Project details but there was a common understanding that overseas volunteers visited rural districts in Vietnam and looked after children's teeth by providing dental check-ups, treatment and oral health education. Three parents explained how they found about the Project accidentally on the treatment day, two having heard from women in the market and a friend that the Australian dentists were at the hospital offering free dental services to children, and that they provided careful, tender and painless treatment. The parents immediately took their children to the hospital for care. One parent had seen projects on television where foreigners visited Vietnam to provide healthcare services and resources, but never imagined such a project would come within 20km of home. The third parent visited the hospital as their child was complaining of dental pain, then found out that the Rotary team was providing free dental services to children. Two parents had received school letters advising them to bring their children to the hospital for dental treatment, but the RAVDH Project was not mentioned. One parent explained that their family had a low income and did not seek regular dental care unless in pain; they extended an appreciation that the Project's free dental service was available to people in such circumstances.

**Question 5 (parents):** Do you think the Project has had an effect on oral health of children in this community?

All parents were positive and grateful that the Rotary team came all the way from overseas, visiting poor Vietnamese communities with little opportunity to access dental care and providing rural children with free treatment and education, enabling them to maintain healthy dental habits for life. While one parent felt they did not know about the Project in detail and found it difficult to name specific impacts as a result of its involvement, another was aware of an oral health program initiated and sponsored by the RAVDHP in a local school which was proving beneficial in promoting oral health to children. Two parents wished programs such as the Project were run regularly and discussed the need to advertise the program more widely to the local community. They had been fortunate to receive treatment from the team but many others, due to lack of advertisement, were unaware the services were available.

**Question 6 (parents):** Have you encountered any difficulties in promoting oral health to your children? If yes, what are they?

Parents differed in their ability to promote tooth-brushing to their children. Some found it easy and children seemed to obey their parents well; once taught and familiar with brushing, they assumed the duty of looking after their own teeth. One parent said their child tooth-brushed without reminder, and even advised the parents if they needed a new tooth brush or toothpaste. Other parents struggled to enforce tooth-brushing with their children, due to child laziness, dislike of tooth-brushing, and falling asleep without brushing. Enforcing dietary habits appeared challenging for all parents as it was difficult to control children's intake of sweets outside the home.

Challenges in oral health promotion to children on a community level were described. There was a lack of dental staff trained in the care of children to meet the needs of the community. Long traveling distances for people living in the district outskirts added inconvenience. Socio-economic disparity in community oral health understanding was mentioned: while some cities were well-developed and oral health promotion was easy, many poor regional communities lacked basic education and knowledge to practice oral hygiene and people could not afford tooth brushes and toothpaste. Parents in these regions might not know how to care for either their own teeth or those of their children. Lack of education was mentioned frequently. While children learnt and practiced oral hygiene in kindergarten programs, good habits were gradually lost when the programs did not continue in primary and secondary schools.

**Question 7 (parents):** Do you think oral health of children in this community could be improved? If yes, please explain.

Despite the above difficulties in oral health promotion, all parents believed oral health of children in their communities could be improved. Education was a recurring area for improvement; teaching and promoting oral health not only to children but also equipping adults as good role models, and enabling teachers and parents to motivate children to maintain good oral hygiene and healthy dietary habits. Benefits of a regular oral health

promotion program such as the Project were also noted by parents. Prioritising healthcare for rural areas and involving foreigners in local communities had been very effective so far. The need for an expanded dental workforce in rural regions was raised, so that current factors hindering access to dental care, such as long distance and lack of education, could be addressed.

#### Dental staff interviews

Responses of 5 dental staff interviewed to 7 questions were collated, as follows:

**Question 1 (dental staff):** What do you think about the general oral health awareness of parents in this community?

All dental staff said oral health awareness of parents varied depending on factors such as location, education, and financial circumstances. Central locations such as cities were associated with higher levels of affluence, education and general hygiene awareness, whilst parents in regional areas appeared to have less knowledge or time to teach their family about oral health due to different life priorities. One dentist said parents in cities would take their children, especially those in the mixed dentition, to a private dentist for a regular dental check-up and clean, and some would even seek early orthodontic intervention. On the other hand, many communities lacked basic oral health knowledge and resources. School health education also appeared superior in bigger cities. Some primary schools in Ho Chi Minh City had ongoing oral health promotion programs and also a dental clinic on-site; other city-based schools arranged for dentists to visit the school and provide basic dental examinations.

**Question 2 (dental staff):** Have you encountered any difficulties in dealing with oral diseases of children in this community? If yes, please explain.

All dental staff reported difficulties in dealing with oral diseases of children. Limited oral health awareness and low income seemed to contribute to a general lack of dental check-ups. All staff noted patients usually sought help only for pain relief, by which time teeth were generally beyond restoration and required extraction. Dental treatment was expensive, rendering regular check-ups and elective treatment unaffordable for many. One dentist found working as a sole dentist was challenging; their working environment was under-staffed

and under-resourced and they found managing fearful children especially difficult. In contrast, one dentist found few difficulties in dealing with oral diseases of children in bigger cities such as Ho Chi Minh City, where people generally had high health awareness and could afford dental care. Even in poorer outskirts of the city, many charities sponsored students to access health services and treatment. Lack of ongoing oral health education was a recurring theme. While schools usually ran general health promotion programs, dental health formed a small part. Cooperation between the Department of Education and local schools would be needed to improve dental health promotion. Varied family circumstances were noted by dental staff: tooth-brushing might not be common daily practice in some families.

**Question 3 (dental staff):** Have you heard about the Rotary Australia-Vietnam Dental Health Project? Describe your role in provision of dental service, and any involvement in the Project.

Four dental staff had been part of the Project for several years; one dentist joined the team for the first time in 2012. All participating Vietnamese dental staff were fully aware of the Project aims and background: to provide restorative care and oral health education to school children in rural districts of Vietnam. A team of dentists, therapists, assistants and students from Australia working with local dentists from the NHOS rotated to different rural Southern Vietnamese districts every 5 years. The role of dental staff in rural districts was to visit local schools, screen and select about 400 12-year-old students for moderate restorative care by the team. Children needing advanced treatment such as root canal treatment and extraction of permanent teeth were excluded. Ongoing assistance was offered by local staff during the Project to ensure smooth operation. One informant was a public dental officer at the NHOS, in charge of collecting and collating oral health reports from all provinces in South Vietnam every four years, travelling to different provinces and selected districts for future involvement with the Project. Discussions also occurred in local district hospitals, schools and government departments regarding oral health promotion.

**Question 4 (dental staff):** Do you think the Project has had an effect on oral health of children in this community?

All dental staff said the Project had made a positive contribution to oral health of children in rural Vietnam by providing restorative dental care that could not otherwise be afforded, and through promotion of healthy diets and tooth-brushing habits for improving oral hygiene awareness of children. The tooth-brushing programs implemented and maintained by Rotary in some schools were mentioned also.

One dentist described the vast treatment need; a few 12 year-old children were selected for care by the Rotary team while many students across all year levels required similar restorative treatment. However, another dentist noted that although not all children requiring treatment could be seen for practical reasons, those seen and educated by the team would continue their new healthy habits and spread their knowledge and awareness among their friends. Dental staff wished the Project could continue in their community. Concerning organisation and outcomes, one dentist said the work was well-distributed and professional; everyone involved in the Project participated with passion. Local governments were also very appreciative of the work of the Rotary team and aimed to undertake health promotion by improving strategies to make dental care more accessible to the community.

**Question 5 (dental staff):** Do you think there are any challenges in encouraging the children in this community to look after their oral health?

All dental staff discussed challenges in oral health promotion to children. Current barriers included severe lack of dentists in the community rendering treatment of diseases and follow-up practically impossible. Oral health and education did not appear to be life priorities; this lack of general dental awareness was thought to be due to limited oral health promotion. Lack of access to fluoride was also mentioned. Bigger cities in Vietnam had community water supplies fluoridated at a level of 0.7ppmF; this was unavailable in rural areas. Of note, specific strategies for implementing water fluoridation were not discussed.

**Question 6 (dental staff):** Do you think oral health of children in this community could be improved? If yes, please explain.

All dental staff saw potential for

improvement in oral health of children in rural Vietnamese communities and suggested ways to combat the persisting current problems, including the lack of general oral health awareness and shortage of dental personnel and resources. Increased government funding would be necessary to expand the public workforce and to provide better resources and strategies for preventive education in schools. Overall, combined efforts of the Department of Education and the Department of Health would be needed to reach areas with poor resources and health. Expanding oral health promotion strategies and fostering access to dental workforce and resources in targeted rural areas would see improvement in oral health of children nationally.

Education was perceived as key to improving population health. Children were generally obedient and compliant with health promotion messages. Promoting oral hygiene needed to be a continuous process, occurring not only across all school year levels but also extending to parents and older adults. With increased television and internet access, incorporating and distributing oral health promotion messages via these media would be effective ways of reaching the population.

Most dental staff said that oral health had already improved significantly since establishment of school-based preventive programs and participation of the RAVDHP. One dentist mentioned a general reduction in the dmft/DMFT index across the nation as shown in the National Oral Health Survey 2012; children now knew to brush teeth after meals and were more aware of negative effects of sugar on teeth than previously. The dental workforce has expanded with 100 new dentists now graduating annually from the dental school in Ho Chi Minh City. There was also expanding interest in oral health, as shown by parents' increasing awareness of orthodontic and dental aesthetic concerns for their children.

## Discussion

### Study limitations

The limitations of this qualitative study conducted under field work conditions are acknowledged. Firstly, the small sample size of informants in each category could have introduced informant bias despite purposive



sampling, as there was no guarantee that their perceptions were typical or representative.<sup>10,11</sup> However, the use of a small sample can be justified on the basis that understanding human issues through in-depth analysis is more meaningful in qualitative research than generalisability of results.<sup>12-14</sup> Secondly, information accuracy was guarded due to the need to use an interpreter. Common mistakes such as omission, addition and condensation of information could have occurred during interpreting, hand-recording and transcribing responses.<sup>15</sup> Thirdly, since the study addressed oral health awareness of children, it would have been useful to directly interview several children, randomly-selected, with regard to their experience and perceptions of oral health.

### Effectiveness of the Project visits

All informants provided generous and very positive feedback on the impact of the Project on oral health of children in rural Vietnam. In communities where preventive intervention through regular check-ups was rare and disease burden was high, the restorative care provided was perceived as valuable and of a high standard. Otherwise, treatment would have been sought only in the presence of pain and when extraction was warranted. Oral health education to children was found to be beneficial. Raising awareness of the need for knowledge of a healthy dentition was believed to support positive changes in oral hygiene and dietary habits. Rotary-implemented tooth-brushing programs in schools were seen also to contribute to the ongoing promotion of healthy habits.

The Project was not without limitations. Due to limited time and resources, only a selected number of students, representing only a few of those with similar treatment needs, had opportunity to be treated by the Rotary team. As one of the aims of the Project was to provide restorative care, students with other treatment needs such as root canal treatment and extraction were excluded in the screening process.

### Increasing the impact of the Project

In order to strategically improve oral health awareness of children in rural Vietnam, current problem areas and barriers to oral health need to be

identified, followed by identification of practical and feasible directions for improvement then implementation of the recommendations. This approach, within the context of the present study, is described schematically in Table 1 (Page 30). As seen from the interview outcomes, the current lack of community awareness of oral health and parallel demand for dental education cannot be over-emphasised.

The anecdote of a girl suffering from 'bleeding gums' due to what appeared to be gingivitis is noteworthy. Due to sensitivity on brushing, she replaced tooth brushing with salty water mouth rinsing. If she and her parents had been better informed or sought professional dental advice, they would have realised that only with thorough mechanical removal of plaque could the symptoms resolve and if not, that further investigation may be necessary. This example highlights the need for oral health knowledge.

Oral health education should not only concern rural children but also reach adults in the community. Lack of parental oral health awareness is a barrier to promoting oral health in children, as parental input is significant in children's dental habit formation. Therefore, it is essential to equip parents with adequate dental knowledge so they can set a high standard of oral hygiene and be good oral health role models for their children. The parental tendency to promote independent tooth-brushing for their children at three years of age should be addressed, as competency and manual dexterity of three-year-olds to perform oral hygiene adequately is dubious. Ongoing supervision in children's tooth brushing activity up to at least 6 years of age, or whenever they can demonstrate competency, should be encouraged.

Oral health promotion could use broader modes of delivery. Age-targeted approaches will make learning effective, for example, devising entertaining and interactive oral health concept games for young children, and using a range of knowledge transfer approaches including health information brochures, internet, television, mobile phones and fast-expanding social media for older students and parents in the digital age.

Ready availability and easy access to sweet items outside the home, combined with behavioural issues such as laziness

and dislike of tooth-brushing, increase the caries potential, especially in the absence of parental control. Therefore, children must be enabled to make their own decisions about oral health habits. School-based oral health promotion can influence these decisions. Expanding the dental component in current health curricula could facilitate oral health discussions and teach students across all year levels how to carry out correct oral hygiene, bridging the gap in current theory-based education with practical demonstrations for more effective learning. But, changes cannot be accomplished by one stake-holder alone. Given willingness to change, an active and combined effort between health and education departments, central hospitals and rural schools is required to achieve these curricular changes.

In order to raise awareness of both the limitations and the opportunities of the Project locally, it may well be necessary to establish better channels of communication with key opinion leaders in local recipient communities. Both team members and those receiving oral health care should be encouraged to relay and promote their positive experiences, thereby reinforcing the Project aims of supporting a self-sufficient oral health delivery system within rural provinces of Vietnam.

### Preservation of oral health awareness after the Project visit

By its very nature, overseas humanitarian aid is of brief duration, and it is paramount that activities implemented by projects can become self-sustaining and independent so that the benefits are maintained after teams depart. Several approaches could be instituted to achieve this. Firstly, during the Project visit, teachers and local staff could be trained as appropriate in the ongoing delivery of the programs instituted by the team, such as oral hygiene practice, application of fluoride varnish, and placement of fissure sealants. Staff and teacher commitment, developed during the Project, could be nurtured by ongoing contact with team members such as by email and social media. Secondly, continuing professional education provided by the team could be extended by team leaders, fostering the use of professional dental information through online resources, sharing of case presentations, and assistance with case management in under-served areas. Thirdly, short-term staff exchanges



could be facilitated by team members who teach in Australian dental schools. Finally, the excellent support already provided by industry could be developed further to include oral health promotion disseminated by key opinion leaders in local communities. Ultimately, the Project hopes to see the recommendations for improvement extend into other rural communities in Vietnam for broader positive oral health outcomes.

## Conclusions

Education was seen to be key to building oral health awareness and school-based oral health promotion programs appeared to be effective. Oral health education must firstly incorporate practical demonstrations and student interactions to complement the theoretical component taught; secondly, continue across all school year levels for continuity in developing healthy dental habits; and thirdly, extend to parents to equip them with knowledge to practice and teach oral hygiene to their children and ultimately raise overall community oral health awareness. Informants considered increasing use of accessible media such as print, television and the internet would facilitate information transfer. Increased funding is required to overcome current oral health barriers of limited infrastructure, resources and rural workforce; promoting rural oral health needs to responsible government departments is essential. Programs implemented by overseas humanitarian aid must be directed towards independence, becoming self-sustainable by local rural communities.

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For further information on the Rotary Australia-Vietnam Dental Health Project, readers are encouraged to contact Dr. Jamie Robertson, on: [jamie@robident.com.au](mailto:jamie@robident.com.au)

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Table 1: Current barriers, strategies and recommendations  
to improve oral health of children in rural communities in Vietnam

Problems and Barriers	Strategy	Recommendations
<ul style="list-style-type: none"> <li>Lack of oral health awareness in children</li> <li>Discontinuity in oral health promotion across schooling</li> <li>Ready availability of sweets in and near schools</li> </ul>	<ul style="list-style-type: none"> <li>Educate children and provide ongoing oral health education</li> </ul>	<ul style="list-style-type: none"> <li>Increase school-based oral health promotion programs</li> <li>Reinforce practical lessons on oral hygiene including regular tooth-brushing and flossing</li> <li>Preserve continuity of oral health education from kindergarten through to senior high school.</li> <li>Endorse healthy habits for the long-term by ongoing educational reinforcement</li> <li>Identify ways to target age groups for effective oral health promotion</li> <li>Equip children themselves with correct knowledge so they can make independent healthy decisions about their own dietary intake</li> </ul>
<ul style="list-style-type: none"> <li>Lack of a longitudinal oral health program in schools</li> <li>Curricular changes in schools cannot be made unilaterally</li> </ul>	<ul style="list-style-type: none"> <li>Seek multiple support for curricular changes to expand oral health education</li> </ul>	<ul style="list-style-type: none"> <li>Advise relevant government departments in education and health of oral health needs</li> <li>Identify opportunities to address these educationally by curricular changes in available health subject/s taught in schools</li> </ul>
<ul style="list-style-type: none"> <li>Lack of oral health awareness in parents</li> </ul>	<ul style="list-style-type: none"> <li>Educate parents and provide ongoing oral health education</li> </ul>	<ul style="list-style-type: none"> <li>Equip parents with oral health knowledge so they can practice good oral hygiene, setting high standards of care and good role models for their children</li> <li>Increase availability and access to oral health information via various media (e.g. print, television, internet) to broaden community access to information in the digital age</li> <li>Encourage parents to directly assist/supervise tooth-brushing and flossing for their children</li> </ul>
<ul style="list-style-type: none"> <li>Challenges for local dental staff working in under-staffed and under-resourced environments</li> <li>Difficulties experienced by local dental staff in managing some patients</li> </ul>	<ul style="list-style-type: none"> <li>Educate dental staff</li> </ul>	<ul style="list-style-type: none"> <li>Develop and provide locally-relevant continuing professional development courses for Vietnamese dental staff working in rural communities dealing with limited resources and complex patient management</li> <li>Train more dental staff, including dentists, therapists and nurses skilled in providing basic dental care and oral health education</li> </ul>
<ul style="list-style-type: none"> <li>Inadequate dental workforce in rural Vietnam</li> </ul>	<ul style="list-style-type: none"> <li>Expand dental workforce and reduce gap between central and rural areas in dental care access</li> </ul>	<ul style="list-style-type: none"> <li>Train more dental staff, including dentists, therapists and nurses skilled in providing basic dental care and education</li> <li>Increase desirability of working in high-need rural areas for dental staff by improving remuneration, infrastructure and resources</li> </ul>
<ul style="list-style-type: none"> <li>Lack of infrastructure and resources</li> </ul>	<ul style="list-style-type: none"> <li>Increase funding</li> </ul>	<ul style="list-style-type: none"> <li>Promote rural oral health needs to responsible government departments to increase funding</li> </ul>
<ul style="list-style-type: none"> <li>Lack of regular dental care</li> <li>Lack of awareness of outcomes of school-based dental check-ups</li> </ul>	<ul style="list-style-type: none"> <li>Promote regular dental care at individual and community levels</li> </ul>	<ul style="list-style-type: none"> <li>Expand dental workforce and distribution to provide ready access to dental care for all</li> <li>Develop public dental health care systems to ensure treatment affordability</li> <li>Ensure outcomes of school-based dental check-ups (for screening or for collection of oral health data) are notified to students, teachers and parents</li> <li>Ensure appropriate treatment recommendations are notified along with sources of referral</li> </ul>
<ul style="list-style-type: none"> <li>Oral health disparities between big cities and rural areas</li> <li>Lack of community water fluoridation</li> </ul>	<ul style="list-style-type: none"> <li>Reduce oral health disparities</li> </ul>	<ul style="list-style-type: none"> <li>Use findings of the National Oral Health Survey (2012) to identify geographic areas with high disease prevalence</li> <li>Target these areas to provide basic oral hygiene resources (e.g. tooth brush, toothpaste, floss) and oral health education</li> <li>Re-direct portion of the available dental workforce on an interim or long-term basis to address oral health care needs in rural areas</li> <li>Implement alternative fluoride modalities to community water fluoridation</li> </ul>
<ul style="list-style-type: none"> <li>Limited availability of overseas humanitarian aid for oral health care</li> <li>Limited understanding on part of rural communities of scope of humanitarian aid such as the RAVDH Project</li> </ul>	<ul style="list-style-type: none"> <li>Expand communication of aims of RAVDH Project and other humanitarian aid projects to rural communities</li> </ul>	<ul style="list-style-type: none"> <li>Improve communication of aims of the RAVDH Project to rural community representatives</li> <li>Assist these communities to become more self-sufficient in delivery of dental care to lessen dependence on humanitarian aid</li> <li>Invite other overseas humanitarian aid groups to participate in healthcare provision in remote, under-resourced areas often with high disease prevalence</li> <li>Encourage participants of the RAVDH Project (both team members and those receiving oral health care) to relay and promote their positive experiences</li> </ul>



by Sue Cartwright,  
BDS, Dip Clin Dent, M Ed



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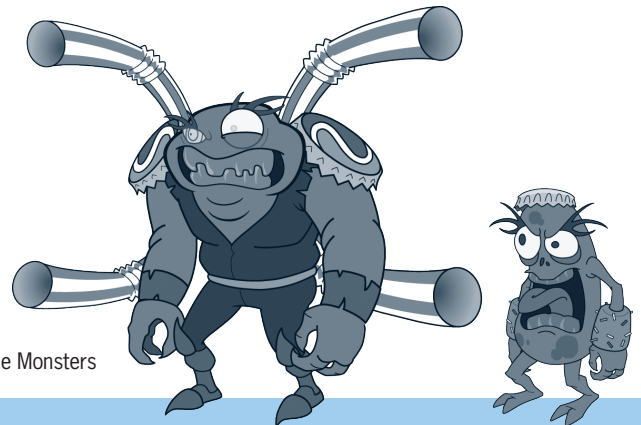
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webmaster@eapd.eu  
www.eapd.gr

3 April – 7 April 2013

35th Australian Dental Congress

Melbourne Convention and exhibition Centre  
Melbourne, Victoria, Australia  
adc2013@ada.org.au\_  
www.facebook.com/adacongress  
www.youtube.com/adacongress

24–27 May 2013

66th AAPD Annual Session

Walt Disney World Swan and Dolphin Resort  
Orlando, Florida. USA  
www.aapd.org



12-15 June 2013

IAPD International Congress

'New Visions for Paediatric Dentistry'  
Coex, Seoul, Korea  
www.iapdworld.org

22–25 May 2014

67th AAPD Annual Session

Hynes Convention Centre/Sheraton Boston Hotel HQ  
Boston. Mass. USA  
www.aapd.org

28 May–1 June 2014

12th EAPD Congress

Sopot, Poland  
webmaster@eapd.eu  
www.eapd.gr

1 July – 4 July 2015

25th IAPD International Congress

Glasgow Scotland UK  
www.iapdworld.org

Singapore 2014

9th Biennial Conference of the Pediatric Dentistry Association of Asia (PDAA),

www.pdaa.asia/pdaa-singapore-2014/

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